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KOPPERS COMPANY, INC.

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QUARTERLY GROUNDWATER MONITORING
FOURTH QUARTER 1998

FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

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1. INTRODUCTION

1.1. MONITORING REQUIREMENTS (RAWP)/ REGULATORY BACKGROUND

This Report has been prepared for submittal to the New Jersey Department of Environmental Protection (NJDEP) to document the results of performance monitoring activities related to the groundwater monitoring program at the former Koppers Seaboard Site (Site) in Kearny, New Jersey. As described in the NJDEP conditionally-approved Remedial Action Work Plan (RAWP)[1], the groundwater monitoring program has three components:

- a natural attenuation performance monitoring plan for Shallow-Zone groundwater;
- a Deep-Zone monitoring plan for Deep-Zone groundwater; and,
- a dense, non-aqueous phase liquid (DNAPL) monitoring plan.

The scope of the groundwater monitoring activities are described in detail in the NJDEP-approved Site Sampling and Analysis Plan (SAP)[2].

The natural attenuation monitoring plan specifies that regulatory standards for Compliance Wells in the Shallow-Zone are New Jersey Class SE-2 Surface Water Quality Criteria (SE-2 SWQC). Because site related Constituents of Interest (COI) as well as background constituents have been detected at levels above the New Jersey Class II-A Groundwater Quality Criteria (II-A GWQC) a Classification Exception Area will be designated for the entire site in accordance with N.J.A.C.7.9-6.6. Regulatory standards for Deep-Zone groundwater are II-A GWQC. Comparisons will be made between groundwater analytical data from Compliance Wells and SE-2 SWQC for Site-related constituents of interest (COI), which include organic constituents derived from coal tar chemicals, and mobile (i.e., free) cyanide. Comparisons will also be made between analytical data from Compliance Wells and SE-2 SWQC for background constituents (i.e., metals); an e Evaluations will be made regarding the time trend of concentrations of background constituents (i.e., metals). General water chemistry and natural indicator parameters will also be summarized to evaluate the effectiveness of the natural attenuation groundwater remedy.

This Report is organized as follows: Section 2.0 describes the monitoring methods; Section 3.0 describes results of the monitoring program; and Section 4.0 summarizes the results and presents recommendations and a schedule for future monitoring activities. Section 5.0 contains a summary of other site activities associated with the RWAP.

1.2. Activities

The focus of this report is to document and summarize results from the groundwater monitoring activities at the Site during the fourth quarter of 1998. Sampling was conducted between December 9 and 16, 1998 with some exceptions. Samples from monitoring wells MW-113, P-19, P-24, and P-25A were temporarily lost by the express courier and not delivered to the laboratory in time to assure that holding times for several analyses were met. Re-sampling of these wells was performed on December 22 and 23 1998.

It should be noted that several preliminary activities were performed as part of the Site remedy, and in preparation for initiation of the monitoring program. These preliminary activities include:

- installation of a combination steel sheetpile wall and slurry wall key into the shallow confining unit along the Site boundary with the Hackensack River, to prevent discharge of Site DNAPL and groundwater to the river;
- installation and development of additional monitoring wells (MW-113, MW-115, MW-116, MW-117, MW-118, MW-119, MW-120, MW-121, MW-122, MW-123, MW-124, MW-125, MW-126, MW-127, MW-128, MW-129, and MW-130) in the Shallow-Zone, for purposes of completing the monitoring well network specified in the RAWP natural attenuation performance monitoring plan;
- abandonment of previously existing Site monitoring wells which are not included in the natural attenuation performance monitoring plan, to comply with N. J. A. C. 7-6:6;
- abandonment, replacement, and development of Site monitoring wells (W-30, W-12, and SWW-5.1) for which relocation was required due to their location within areas where remedial construction was or is to be performed; and,
- refurbishment of previously existing or newly installed monitoring wells which are located within areas where remedial construction was or is to be performed.

Plans for these activities were included in the RAWP. Further description of these activities has been submitted or will be submitted to NJDEP under separate cover.

2. METHODS

This section describes the activities and methods used for the Shallow and Deep-Zone groundwater monitoring plans as well as implementation of the natural attenuation performance monitoring plan and DNAPL monitoring plan, previously described in the RAWP. Activities were completed in accordance with the SAP.

Existing monitoring wells and the monitoring programs conducted during the fourth quarter 1998 are listed in Table 2-1. The locations of all Site monitoring wells are shown on Figure 2-1.

Please note that one additional Shallow-Zone monitoring well (MW-130) beyond those proposed was installed during pre-monitoring activities. The additional well (MW-130) was installed to the south of MW-115 (Figure 2-1) to replace MW-115 in the natural attenuation performance monitoring plan, and added to the DNAPL monitoring plan. This was because DNAPL was observed to be present in newly-installed monitoring well MW-115.

Proposed shallow monitoring well MW-114 was not installed, due to off-Site access issues.

2.1. GROUNDWATER LEVEL MEASUREMENTS

Depth to groundwater measurements in Shallow-Zone monitoring wells were gauged over the entire Site (Figure 2-1) according to the bi-weekly schedule proposed in the RAWP and SAP. In addition, the groundwater levels were observed to rise steadily within the Eastern Area of the Site while barrier wall construction was on-going; therefore, water level measurements were obtained during the "off" week between bi-weekly measurements in Shallow-Zone wells in the Eastern Area. Water level measurements were obtained from the Shallow-Zone monitoring wells specified in the RAWP and SAP, plus additional well MW-130.

Depth to water measurements were gauged in Deep-Zone monitoring wells (Figure 2-1) at a frequency greater than the quarterly monitoring proposed in the RAWP and SAP. Deep-Zone water levels were gauged on a bi-weekly basis, in conjunction with the Shallow-Zone water level monitoring.

In accordance with the SAP, measurements were made using a Solinst Model 101 Water Level Meter or Solinst Model 122/P1 Interface Meter, depending on whether the well was also included in the

DNAPL Monitoring Plan. The meter/probe was decontaminated as specified in the SAP between wells.

2.2. DNAPL Thickness Measurements

DNAPL thickness measurements were gauged in several shallow and Deep-Zone Site monitoring wells (Figure 2-1) to evaluate whether DNAPL migration was occurring. DNAPL thickness measurements were obtained from wells specified in the RAWP and SAP, plus additional well MW-130.

In accordance with the SAP, measurements were made using a Solinst Model 122/P1 Interface Meter. Depth to DNAPL and total well depth were gauged to calculate the DNAPL thickness in wells where DNAPL was observed; for wells in which DNAPL presence was not observed, the total well depth was gauged to verify that DNAPL was not present. The meter/probe was decontaminated as specified in the SAP between wells.

2.3. Groundwater Sampling and Analysis

Groundwater sampling was conducted from all Shallow and Deep-Zone wells specified in the RAWP and SAP (Figure 2-1), with several exceptions (Table 2.1). Replacement well W-12R was substituted for previously existing well W-12; and MW-115 was replaced by MW-130. Also, MW-105 is no longer designated as a compliance well, as it is located outside the southern wing of the slurry wall. W-12R was installed directly across the slurry wall from MW-105 and is designated as a compliance well.

Groundwater sampling was performed using the dedicated Timco bladder pump system, with Teflon tubing. The pumps were set at approximately the midpoint of the screened interval. Wells were purged and sampled using low-flow techniques, as recommended by U.S. EPA Region II[3] and NJDEP to obtain samples most representative of groundwater. Water was purged from each well at a rate of approximately 100 mL/min prior to sampling. Depth to water in the well was gauged continuously during purging to insure that the water level was not being drawn down, as recommended by U.S. EPA. During groundwater purging, field parameters temperature, pH, specific conductance, turbidity, dissolved oxygen, and oxidation-reduction potential were continuously monitored with the use of a flow-through cell (YSI Model 8260 Sonde and YSI Model 610 hand-held display unit). It should be noted that some of the field parameter readings (e.g. dissolved oxygen) were qualified on the Field Data Sheets based on equipment limitations observed at the time of the readings. Field parameters were recorded on a three- to five-minute interval to evaluate the time trend of these parameters and determine when they ceased to change with time. When the field parameters reached approximately stable reading, the flow-through cell was taken off-line, and groundwater samples were immediately collected directly through the dedicated tubing into the laboratory-supplied bottles. Field Data Sheets are included as Appendix A.

Samples were collected for analysis of Site-related constituents of interest (COI), background constituents, and general chemistry/natural attenuation indicator parameters; Shallow-Zone groundwater sample parameters (Table 2-2), and Deep-Zone groundwater sample parameters (Table 2-3). Samples were collected in order of decreasing volatility of the parameter being analyzed. Sample bottles were immediately cooled after collection. All analyses were performed by SK (ENCOTEC) (Ann Arbor, Michigan), a NJDEP-certified laboratory.

Quality assurance/quality control (QA/QC) samples were collected in accordance with the SAP (Table 2-4). QA/QC samples included trip blanks, field blanks, duplicate samples, and matrix spike/matrix spike duplicate analyses. QA/QC samples were prepared using analyte-free water supplied by the laboratory.

Sampling was conducted between December 9 and 16, 1998 with some exceptions. Samples from monitoring wells MW-113, P-19, P-24, and P-25A were temporarily lost by the express courier and not delivered to the laboratory in time to assure that holding times for several analyses were met. Re-sampling of these wells was performed on December 22 and 23 1998.

Samples from MW-123, MW-124, and MW-129 for cyanide analyses were not analyzed within the specified holding times. These wells were re-sampled for cyanide analysis only on January 13, 1999.

3. RESULTS

Results of the fourth quarter 1998 monitoring event is summarized below. The discussion is divided into two sections; Shallow-Zone and Deep-Zone.

3.1. SHALLOW ZONE

Results of Shallow-Zone monitoring is discussed below. The discussion is divided into three sections: groundwater flow, DNAPL presence and extent, and groundwater quality.

3.1.1. GROUNDWATER FLOW

Depth to water measurements and potentiometric surface elevations are presented in Table 3-1. Groundwater potentiometric surface contour maps for the Shallow-Zone are shown in Figures 3-1a to 3-1r. In general, groundwater flow patterns are seen to be similar to those historically observed during the early part of the period, as a groundwater mound exists in the Eastern Area and groundwater discharges to the Hackensack River across the Site. However, examination of the potentiometric surface contours over time shows that the groundwater flow patterns in the Shallow-Zone have changed to some extent during the reporting period. Construction of the slurry wall and steel sheetpile wall, and placement of the PDM cover in the southeastern part of the Site have changed the groundwater flow patterns. As discharge to the river is cut off, the flow patterns in the Central and Western Areas have changed from a northward discharge (i.e., to the river) to a more westward direction of flow. In addition, groundwater in the Eastern Area has become increasingly isolated as a result of barrier wall construction. As discharge to the river is cut off, groundwater in the Eastern Area shows an increasing tendency to flow southward. The change in flow direction is similar to that predicted during the groundwater flow and transport modeling, included in the RAWP.

3.1.2. DNAPL PRESENCE AND EXTENT

DNAPL thickness measurements are presented in Table 3-2. DNAPL presence in the Shallow-Zone was observed only in the northeastern portion of the Site, which is consistent with historic observations. The DNAPL thickness monitoring confirms that the areal extent of DNAPL has not changed since the start of the monitoring period. Changes in apparent DNAPL thickness observed in

Shallow-Zone wells during the reporting period are slight, and do not show a consistent trend over time.

3.1.3. GROUNDWATER QUALITY

Analytical results from the Shallow-Zone during the fourth quarter 1998 event are discussed in this section. The section is divided into two sub-sections; Compliance Wells and Monitoring Wells.

In general, the groundwater at the Site contains elevated concentrations of inorganic analytes approaching that of saltwater. The six most abundant constituents of saltwater: chloride, sodium, sulfate, magnesium, calcium, and potassium; were detected at similar ratios in the groundwater[4]. Due to the proximity of the Hackensack River, the saline characteristic of the groundwater is most likely a result of saltwater intrusion from the river. The groundwater quality at this Site is degraded due to natural background conditions, the mixing of fresh and saltwater, as well as the historical industrial land use in the area (local and regional). This may include elevated groundwater concentrations of certain inorganic constituents that may not be process related and may be due to subsurface geologic conditions or biodegradation.

In accordance with the NJDEP-approved RAWP, the criteria applicable to the shallow zone compliance wells are SE-2 SWQC. SE-2 surface waters are defined as saline estuarine waters whose designated uses are listed in N.J.A.C. 7:9B-1.12(e). The New Jersey Class II-A GWQC are applicable to the deep zone at the site. Volatile organics, semi-volatile organics and cyanide have been designated as the COIs for site groundwater. The natural attenuation fate and transport modeling contained in the RAWP was performed to predict dissolved concentrations of organic constituents and provide the basis for the development of a Monitored Natural Attenuation Plan which is the primary objective of the SAP. The RAWP established that concentrations of various metals in both the shallow and deep zones were consistent with background levels in the vicinity of the Seaboard Site. Therefore, metals will be evaluated over-time to determine if the activities at the site are significantly altering the respective metal concentrations.

Total cyanide is included as an analyte in the SAP, however total cyanide at coal gasification sites historically have been shown to be comprised of ferric, ferro-cyanide complexes, which are very stable and non toxic. Both the State of New Jersey and the U.S. Environmental Protection Agency (EPA) express the recommended surface water quality criterion as free cyanide (63 FR 67548-67558 December 7, 1998). Therefore comparisons to groundwater and surface water standards will only be made for free cyanide.

3.1.3.1.Compliance Wells

The fourth quarter 1998 Shallow-Zone groundwater data for Compliance Wells are discussed and compared with previous results when available. Tables 3-3 through 3-6 contain a summary of the 1998 fourth quarter Shallow-Zone groundwater monitoring data. Table 3-3 summarizes the mean, number of measurements, and range of detected concentrations. Table 3-4 and 3-5 are sub-divided into four analyses categories, general chemistry, total metals, organics (semi-volatiles), and organics (volatiles). Table 3-6 presents data historical data for available well locations. The New Jersey Class SE-2 Surface Water Quality Criteria (SE-2 SWQC) are also presented in the table. The following is a discussion of the results for each category. In addition, wells with parameters exceeding the SE-2 SWQC are identified. However, changes in sampling methods, analytical laboratory, and analyte detection limits, make historical time series comparison of limited value at this time. The first quarter 1999 groundwater sampling event will provide additional data for making historical time series comparisons and identifying changes in parameter concentrations.

General Chemistry and Field Parameters

Results of general chemistry and field parameters are shown in Table 3-4. The general chemistry and field parameters include: total alkalinity, carbon dioxide, chloride, total and free cyanide, dissolved oxygen, iron (ferrous), methane, nitrate and nitrite, oxidation reduction potential, pH, specific conductivity, sulfate, temperature and turbidity. Two parameters common in saltwater, chloride and sulfate, were present in ratios similar with saltwater. None of the samples had free cyanide detected above the practical quantitation limit (PQL) or above the SE-2 SWQC for free cyanide of 1.0 ug/L.

Total Metals/Comparisons With Historical Data

Five of the Shallow-Zone Compliance Wells (MW-103, MW-104, MW-106, P-19, and SWW-25) were sampled during the third quarter in 1997. One well, MW-103 was also sampled in second quarter of 1998. A summary of detected parameters and comparison with historic data is presented in Table 3-6. For the five wells, the total number of organic compounds detected above the PQL has significantly decreased between 1997 and 1998. Metals data were inconclusive, with increases observed at some wells, decreases at other wells, and some wells showing no substantive change. However, changes in sampling methods, analytical laboratory, and analyte detection limits, make historical time series comparison of limited value at this time. The quarterly 1999 groundwater sampling event will provide additional data for making historical time series comparisons and identifying changes in parameter concentrations.

Organics, Semi-Volatile

Three of eight wells (W-102R, MW-104 and MW-113) had detections for semi-volatile organic compounds. For the three wells, eight out of 64 compounds were detected above the PQL (Table 3-4). The compounds identified include: acenaphthene, acenaphthylene, carbazole, fluorene, 2-methylnaphthalene, naphthalene, phenanthrene, and phenol. Each compound was detected at no more than two locations. The range of concentrations for individual semi-volatile organics was 10 ug/L (acenaphthylene) to 190 ug/L (Phenol). None of the compounds detected exceeded the SE-2 SWQC.

Organics, Volatile

Two of eight wells (W-102R and MW-113) had detections for volatile organic compounds (Table 3-4). For the two wells, two out of 33 compounds were detected above the PQL. The compounds identified were acetone and 2-butanone (MEK) and may be laboratory artifacts in origin. Both acetone and MEK are recognized by the USEPA as common laboratory artifacts. The range of concentrations for these compounds was 21 ug/L (MEK) to 120 ug/L (acetone). Neither of the compounds detected exceeded the SE-2 SWQC.

3.1.3.2. Monitoring Wells

The fourth quarter 1998 Shallow-Zone groundwater data for monitoring wells are discussed and compared with previous results when available. Since these wells are located within the area of concern, higher concentrations of organic *contaminants* may be expected. While these wells are not subject to the SE-2 SWQC, they are included in the table for reference. The following is a discussion of the results for each category. General groundwater quality is discussed and compared with previous sampling when data exists. However, changes in sampling methods, analytical laboratory, and analyte detection limits, make historical time series comparison of limited value at this time. The first quarterly 1999 groundwater sampling events will provide additional data for making historical time series comparisons and identifying changes in parameter concentrations.

General Chemistry and Field Parameters

Results of general chemistry and field parameters are shown in Table 3-5. The general chemistry and field parameters include: total alkalinity, carbon dioxide, chloride, total and free cyanide, dissolved oxygen, iron (ferrous), methane, nitrate and nitrite, oxidation reduction potential, pH, specific conductivity, sulfate, temperature and turbidity. Two parameters common in saltwater, chloride and sulfate, were present in ratios similar with saltwater. The mean, number of measurements, and range of concentrations is summarized in **Table 3-3.**

Total Metals/Comparisons With Historical Data

Twenty three analytes were analyzed for all samples (Table 3-5). Four analytes common in saltwater, calcium, magnesium, potassium and sodium, were present in ratios similar with saltwater. Two analytes (arsenic and manganese) were detected above the PQL. Manganese was detected in all eighteen wells. The range of concentrations were 0.04 to 3.3 mg/L. Manganese is detected Site-wide and the concentrations present may represent natural background concentrations. A study of groundwater resources[5] in the area reported background manganese concentrations in the range of 0.01 to 0.55 mg/L. Arsenic was detected in ten wells. The range of concentrations for arsenic was less than the PQL to 240 ug/L. Arsenic is detected above the PQL Site-wide and may represent natural or background concentrations.

Six of the shallow monitoring wells (MW-105, MW-108, MW-109, MW-110, MW-112, and P-24) were sampled during the third quarter in 1997. Two wells, MW-110 and MW-112 were also sampled in the second quarter of 1998. A summary of detected parameters is presented in Table 3-7. For the six wells, the total number of organic compounds detected above the PQL has significantly decreased between 1997 and 1998. Metals data were inconclusive, with increases observed at some wells, decreases at other wells, and some wells showing no substantive change. Metals were detected, as expected, in both the shallow and deep zones across the site. However, changes in sampling methods, analytical laboratory, and analyte detection limits, make historical time series comparison of limited value at this time. The 1999 quarterly groundwater sampling events will provide additional data for making historical time series comparisons and identifying changes in parameter concentrations.

Organics, Semi-Volatile

Eleven of eighteen wells (MW-108, MW-109, MW-110, MW-116, MW-118, MW-119, MW-121, MW-122, MW-124, MW-130 and P-24) were detected above the PQL for semi-volatile organic compounds (Table 3-5). For the eleven wells, seven out of 64 compounds were identified. The compounds identified include: acenaphthene, carbazole, di-n-butyl phthalate, 1,4-dichlorobenzene, 2,4-dimethylphenol, naphthalene, and phenanthrene. The range of concentrations for semi-volatile organics was 10 ug/L (phenanthrene) to 8100 ug/L (naphthalene).

Organics, Volatile

Six of eighteen wells (MW-108, MW-109, MW-118, MW-121, MW-124, P-24) had detections for volatile organic compounds (Table 3-5). For the six wells, seven out of 33 compounds were detected above the PQL. The compounds identified include: acetone, benzene, chlorobenzene, ethylbenzene, methylene chloride, toluene, and total xylenes. Both acetone and methylene chloride are recognized by the USEPA as common laboratory artifacts. Each compound was detected at between two to four locations. The range of concentrations for volatile organics was 11 ug/L (total xylenes) to 2900 ug/L (benzene).

3.1.3.3. Natural Attenuation Indicator Parameters

Trends in hydraulic head data, shown in Figures 3-1a through 3-1r, indicate that groundwater flow directions during the construction period are generally consistent with those predicted by the natural attenuation modeling in the RAWP. These data generally show the development of a groundwater mound in the eastern end of the site, through the fall of 1998. This mound results in a southward flow component, from the eastern end of the site.

Preliminary trends in groundwater chemistry data from compliance and monitor wells are generally consistent with the predicted behavior of groundwater and dissolved phase COIs, as predicted by natural attenuation modeling. However, discussion of these trends is qualified by the following:

- the data record for most of the wells is limited at this time, providing limited basis for comparison of pre-construction and construction stage data;
- sampling methods used for 4th Quarter 1998 samples were different than those used previously; this change was implemented to comply with recent improvements in protocols endorsed by NJDEP; previous and current methods may carry different sampling biases, depending on the analytical parameter.

Comparison of redox-related data between wells also indicates the occurrence of natural attenuation reactions. The following provides a summary of mean concentrations for selected parameters from the 4th Quarter 98 data set. Data are grouped on the basis of the detection or absence of COIs in groundwater at the monitoring location. As shown, mean concentrations of iron (ferrous), manganese and methane are higher for wells where COIs were detected. This trend is consistent with the production of these constituents through biodegradation reactions. Similarly, ORP readings tend to be lower in groundwater containing COIs, which is consistent with electron acceptor utilization through COI biodegradation. In the case of the sulfate, mean concentrations do not show the expected trend: an increase is shown for the set of wells containing COIs. However, it is noted that site groundwater is generally high in sulfate and chloride, possibly due to the past influence of Hackensack River, which is known to be somewhat saline. The table presents the ratio of sulfate and chloride concentrations, to evaluate for relative changes. The mean of this ratio is lower for the set of wells containing COIs, which is consistent with COI biodegradation through sulfate-reduction.

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Mean concentrations for selected redox-related parameters.

Redox-related parameters		Wells with Non-detectable COIs	Wells with detectable COIs
Iron (ferrous; ug/L)	Mean	13,135	23,380
	n	12	14
Manganese (ug/L)	Mean	737	1,212
	n	12	14
ORP (mV)	Mean	-55.8	-111.7
	n	9	14
Methane (ug/L)	Mean	3,389	6,578
	n	12	14
Sulfate (ug/L)	Mean	162,464	217,514
	n	11	14
Sulfate:Chloride (dimensionless)	Mean	0.46	0.08
	n	11	14

Compliance well data for COIs was consistent with the transport predictions on the natural attenuation modeling: no substantive increase was observed for any parameter.

3.2. DEEP ZONE

Results of Deep-Zone monitoring are discussed below. The discussion is divided into three sub-sections; groundwater flow, DNAPL presence and extent, and groundwater quality.

3.2.1. GROUNDWATER FLOW

Depth to water measurements and potentiometric surface elevations are presented in Table 3-7. A groundwater potentiometric surface contour map for the Deep-Zone is shown in Figure 3-2. Groundwater flow patterns in the Deep-Zone during the reporting period were similar to those observed historically. The potentiometric surface highs within the Deep-Zone are in the northern and eastern areas of the Site, and indicate that groundwater flows to the west and south.

3.2.2 DNAPL PRESENCE AND EXTENT

DNAPL has been shown historically to be absent in the Deep-Zone. All DNAPL thickness measurements obtained from Deep-Zone monitoring wells during the reporting period confirmed the absence of DNAPL in the Deep-Zone.

3.2.3 GROUNDWATER QUALITY

Analytical results from the Deep-Zone during the fourth quarter 1998 event are discussed in this section. Similar to the Shallow-Zone, the Deep-Zone groundwater contains elevated concentrations of common metals and ions found in saltwater. In addition, the concentration of total dissolved solids indicate brackish water. The general chemistry data indicates that the composition of the deep water at this Site is influenced by the saline nature of the local surface saltwater environment. Due to the brackish nature of the Deep-Zone groundwater, chloride, sodium, and total dissolved solids, may exceed the are New Jersey Class II-A Groundwater Quality Criteria (II-A GWQC).

3.2.3.1. Monitoring Wells

The fourth quarter 1998 Deep-Zone groundwater monitoring data are discussed and compared with previous results when available. Table 3-8 contains a summary of the 1998 fourth quarter Deep-Zone groundwater monitoring data. The table is broken into four analyses categories, general chemistry, total metals, organics (semi-volatiles), and organics, (volatiles). The (II-A GWQC) are also presented in the table. Wells with parameters exceeding the II-A GWQC are identified. The following is a discussion of the results for each category.

General Chemistry and Field Parameters

Results of general chemistry and field parameters are shown in Table 3-8. The general chemistry and field parameters include: chloride, total and free cyanide, dissolved oxygen, oxidation reduction potential, pH, specific conductivity, temperature and turbidity. Chloride and total dissolved solids were detected in every sample at concentrations classified as slightly to moderately saline. The total dissolved solids (TDS) range from 920 to 7000 mg/L. The chloride concentration range is 550 to 5100 mg/L. Both TDS and chloride were above the II-A GWQC. The ratio of saltwater constituents in the Deep-Zone groundwater indicate that there is likely some fresh and saltwater mixing[4]. Due to this mixing, TDS and chloride may exceed the II-A GWQC given the nature of this groundwater system. None of the samples had detectable concentrations above the PQL for free cyanide. Two of the seven samples contained total cyanide, although neither well had a concentration above the II-A GWQC of 200 ug/L.

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Total Metals/Comparisons With Historic Data

Twenty three metals were analyzed for in all samples (Table 3-8). Seven of the twenty three metals were not detected in any of the samples: antimony, beryllium, chromium, mercury, selenium, silver, and thallium. Another four of the twenty three metals were detected at no more than three locations: cobalt, copper, vanadium, and zinc. Five of the twenty three metals were detected in six or seven of the samples.

Four of the Deep-Zone wells (W-13R, W-17, W-25, W-29 and W-31) were sampled during the second quarter in 1997. One well, W-13R was also sampled in first quarter of 1998. A summary of detected parameters and the percent change is presented in Table 3-9. For the wells, the number of organic compounds detected has decreased between 1997 and 1998. Metals data were inconclusive, with increases observed at some wells, decreases at others, and others showing no substantive change. However, changes in sampling methods, analytical laboratory, and analyte detection limits, make historical time series comparison of limited value at this time. The quarterly 1999 groundwater sampling events will provide additional data for making historical time series comparisons and identifying changes in parameter concentrations.

Organics, Semi-Volatile

Two of seven wells (W-13R and W-29) had semi-volatile organic compounds detected (Table 3-8). For the two wells, six out of 64 compounds were identified. The compounds identified include: acenaphthene, carbazole, dibenzofuran, fluorene, naphthalene, and phenol. None of the compounds detected exceeded the II-A GWQC. The range of concentrations for semi-volatile organic compounds was 10 ug/L (naphthalene) to 28 ug/L (acenaphthene).

Organics, Volatile

No volatile compounds were detected above the PQL in any of the Deep-Zone wells (Table 3-8).

3.3. FIELD AND LABORATORY QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC)

Samples collected during the fourth quarter 1998 followed the procedures for field and laboratory quality assurance and quality control (QA/QC) specified in the sample and analysis plan (SAP) dated June 1998. The following sections summarize the QA/QC for both the field and laboratory.

3.3.1. Field QA/QC

Field QA/QC consisted of trip blanks, field blanks, and field duplicates. Seven trip blanks, two field blanks, and two field duplicates were collected and analyzed. No target compounds were detected in any of the trip or field blanks. Field duplicate samples were collected for monitoring wells MW-124 and P-19. In general, the relative percent difference (RPD) were acceptable with the following exceptions:

- For sample MW-124, carbon dioxide and sulfate RPDs were between 20% and 60%, while the remaining parameters were under 20%.
- Two compounds, acetone and free cyanide, were only detected in the duplicate for MW-124.
- For P-19, Chloride and nitrogen as nitrite and nitrate, had RPDs of 145% and 75%, respectively; while the remaining parameters were under 20%.

See Table 3-10 for a complete summary of field duplicate RPD results. In general, the RPDs were acceptable.

3.3.2. Laboratory QA/QC

All samples were analyzed within holding time with the exception of MW-124 for volatile organic compounds. The initial VOC analyses of MW-124 did not correspond with the results of the field duplicate of MW-124, designated MW-200. The second VOC vial for MW-124 was subsequently analyzed out of holding time limits. The analytical results were similar to MW-200 (see Table 3-10 for RPD results). The results of both sets of analyses are reported (MW-124 and MW-200). Because the analyses of MW-124 were performed outside of holding time limits, the results for MW-200 are used for interpretation and presented in Table 3-5. There were no target analytes detected in any of the laboratory method blanks. All laboratory control spike (LCS), matrix spike (MS) and matrix spike duplicates (MSD) met the EPA quality assurance guidelines. A more complete summary of laboratory QA/QC is contained in the laboratory narrative in Appendix B. The electronic data

4. SUMMARY/SCHEDULE

As described in Section 3.0, the results of the fourth quarter 1998 groundwater monitoring event were relatively consistent with previous monitoring results at the Site. No Site-related organic constituents were detected above applicable standards in either the Shallow-Zone Compliance Wells (SE-2 SWQC) or the Deep-Zone Wells (II-A GWQC). Exceedances were noted for some inorganic parameters (mostly metals), however, concentrations of these parameters are distributed Site-wide, may be reflective of background and/or brackish groundwater conditions, and are not necessarily related to previous Site activities. For these reasons, re-sampling activities as specified in the RAP and SAP were not scheduled. The NJDEP was notified of these exceedances (via verbal communication) per RAWP and SAP requirements.

The First Quarter 1999 sampling event is scheduled to be completed in mid to late March. The NJDEP will be notified in advance of this sampling event as soon as the schedule is finalized.

5. SUMMARY OF RAWP SITE ACTIVITIES

The following provides a summary of activities associated with the RAWP that were conducted throughout the fourth quarter of 1998. This summary is being submitted at the request of the NJDEP in lieu of submitting monthly status reports.

5.1. BARRIER WALL

Slurry Wall

Phase II of the slurry wall commenced during the reporting period. A total of approximately 4,200 linear feet of slurry wall has now been constructed as specified by the RAWP. The slurry wall was completed in accordance with the RAWP with one exception. Preceding the slurry wall construction, borings were advanced along the slurry wall alignment to confirm the depth and thickness of the confining unit. When it was discovered that the peat or meadow mat unit was not as thick (three feet or more) than anticipated it was decided that the slurry wall was to be advanced to the next (deeper) confining unit which consists of varved clay. Accordingly, SK's contractor, Conti Environmental, advanced the slurry wall into the varved clay unit along the remainder of the alignment where the thickness of the peat unit was not adequate. The construction of the slurry wall into the clay unit is more protective than originally specified in the RAWP. QA/QC oversight and testing was conducted throughout the slurry wall construction activities. At the conclusion of the slurry wall construction, confirmatory undisturbed samples were collected at 500 ft intervals for laboratory permeability testing. The laboratory testing verified that the permeability of the slurry wall met RAWP requirements. In accordance with N.J.A.C. 7:26E-6.6, results and documentation of all appropriate field and laboratory QA/QC testing and measurements will be provided in a comprehensive Remedial Action Report (RAR).

Steel Sheet Pile Wall

The steel sheet pile wall (SSP) was constructed during the reporting period. In total approximately 6,000 feet of SSP has been installed in accordance with the RAWP. A starter trench was excavated ahead of SSP construction. A floating boom was maintained throughout the construction activities. The SSP was constructed as specified in the RAWP with one exception. The RAWP did not specify sealing of the SSP joints along the alignment where the slurry wall was installed. SSP joints were sealed in this area and thus the SSP was more protective than the RAWP requirements. In accordance with N.J.A.C. 7:26E-6.6, results and documentation of all appropriate field QA/QC testing and measurements will be provided in a comprehensive Remedial Action Report (RAR).

PDM Key

No construction activities associated with the PDM key were completed during the reporting period. Some preliminary borings along the PDM Key alignment were obtained in order to better define subsurface conditions. Also, undisturbed samples of the silt unit overlying the peat unit were obtained for laboratory permeability testing. Permeability testing results indicate that the silt unit is lower in permeability than RAWP requirements. Based on the results of this testing, the PDM key will be tied into either the silt unit or peat unit whichever is encountered first. Construction activities are anticipated to be conducted in the second quarter of 1999. The NJDEP will be notified in advance of construction activities.

5.2. TANK/BUILDING DEMOLITION

Tank

SK/Beazer selected an acceptable disposal location and obtained all the necessary EPA approvals for transport and disposal of the tank contents during the reporting period. Construction activities will commence in the first quarter of 1999.

Building Demolition

SK completed sampling and evaluation of the asbestos contained in the building during the reporting period. SK anticipates bidding, contractor selection, asbestos abatement and building demolition during the first and second quarter of 1999.

5.3. PDM SURFACE COVER

PDM was placed over approximately 18 acres in the eastern area in accordance with temporary HMDC zoning approval during the fourth quarter of 1998. In addition, a leveling layer of PDM was placed in the non-wetland sections of the western area as approved by a HMDC temporary zoning approval. As part of the eastern area PDM cover the south eastern area stormwater basin construction was initiated. Basin inlet and outfall protection/structures will be completed pending approval from the various regulatory agencies.

5.4. AREA OF CONTAMINATION (AOC)

As specified in the RAWP, slurry trench spoil, waste piles, sediments and dike material generated from the SSP starter trench were placed in the AOC Large debris (timbers and steel etc.) were removed from the materials. Locations of the materials will be surveyed, graded and covered with PDM. It is anticipated that construction within the AOC will not be complete until all designated waste piles, and river sediments are addressed as specified in the RAWP and as discussed in their respective sections.

5.5. SEDIMENTS

No activity associated with the sediments were conducted during the reporting period. Sediment remediation will commence once the AOCE Section 10 and 404 wetlands permit have been obtained.

5.6. WASTE PILES

The majority of the designated waste piles are located either directly in adjacent to wetlands. Some designated waste materials are located in the intertidal zone. Due to their locations, remediation activities cannot commence until the AOCE Section 10 and 404 wetlands permit have been obtained.

5.7. INTERIM REMEDIAL MEASURES (IRM) SYSTEM OPERATION

The IRM operated throughout the reporting period with the exception of several short term shut down periods required for modifications/repairs or due to construction of the barrier wall. Table 5-1 lists the cumulative shutdown period of the IRM system. This time will be added to the operation time specified in the RAWP.

5.8. SCHEDULE

A revised schedule is provided as Figure 5-1 of this report.

6. REFERENCES

1. May 7, 1998. NJDEP Conditional Approval of April 2, 1998 Remedial Action Work Plan: Former Koppers Seaboard Site, Kearny, New Jersey

2. June 1998. Sampling and Analysis Plan: Former Koppers Seaboard Site, Kearny, New Jersey

3. U.S. Environmental Protection Agency Region II, Groundwater Sampling Procedures: Low-flow Purging and Sampling

4. Study and Interpretation of the Chemical Characteristics of Natural Water, Third Edition, United States Geological Survey Water-Supply Paper 2254

5. Geology and Ground-water Resources of the Rahway Area, New Jersey, Special report No. 27, 1968, U.S. Geological Survey

TABLES

TABLE 2-1
MONITORING WELL FUNCTIONS
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Well ID	Water Level Monitoring	Groundwater Sampling and Analysis	DNAPL Thickness Monitoring	Comments
Shallow Zone Wells				
MW-100	x			
MW-101	x			
MW-102R	x	x		
MW-103	x	x		
MW-104	x	x		
MW-105	x	x		
MW-106	x	x		
MW-108	x	x		
MW-109	x	x		
MW-110	x	x		
MW-111	x			
MW-112	x	x	x	
MW-113	x	x		
MW-114	x (1)	x (1)		Not yet installed
MW-115	x		x	DNAPL in well; MW-130 replaces for sampling
MW-116	x	x	x	
MW-117	x	x	x	
MW-118	x	x	x	
MW-119	x	x		
MW-120	x	x		
MW-121	x	x		
MW-122	x	x		
MW-123	x	x		
MW-124	x	x		
MW-125	x			
MW-126	x			
MW-127	x			
MW-128	x			
MW-129	x	x	x	
MW-130	x	x	x	Replaces MW-115 for sampling and analysis
P-19	x	x		
P-20	x		x	
P-22	x		x	
P-24	x	x	x	
P-25A	x	x		
SWW-5.1	x		x	
SWW-25	x	x		
W-9	x		x	
W-12R	x	x		
W-27	x		x	
Deep Zone Wells				
C-3	x	x	x	
SWW-6.5	x		x	
SWW-7.5	x		x	
SWW-9	x		x	
W-13R	x	x	x	
W-17	x	x		
W-25	x	x	x	
W-29	x	x	x	
W-30	x	x		
W-31	x	x		

NOTES:
(1) MW-114 is to be implemented into these phases of monitoring when installed

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TABLE 2-2
SHALLOW ZONE GROUNDWATER ANALYTICAL PARAMETERS
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Parameter	Method
Constituents of interest	
TCL VOCs	EPA Method 624
TCL SVOCs	EPA Method 625
TAL Metals	EPA Method 200.7
Total cyanide	EPA Method 335.1/335.2
Free cyanide	SM 4500-CN (I)
Natural attenuation indicators / general chemistry parameters	
pH, specific conductance, temperature, dissolved oxygen, redox potential, turbidity	Field parameters (in conjunction with low flow methods and flow-through cell)
alkalinity	EPA Method 310.2/310.1
nitrate	EPA Method 353.2/353.3
sulfate	EPA Method 375.4
manganese	EPA Method 200.7 (w/ metals)
ferrous iron	SM 3500-Fe.D
methane	EPA Method 8015
carbon dioxide	ASTM D-4500
chloride	EPA Method 325.1/325.3

TABLE 2-3
DEEP ZONE GROUNDWATER ANALYTICAL PARAMETERS
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Parameter	Method
Constituents of interest	
TCL VOCs	EPA Method 624
TCL SVOCs	EPA Method 625
TAL Metals	EPA Method 200.7
Total cyanide	EPA Method 335.1/335.2
Free cyanide	SM 4500-CN (I)
Natural attenuation indicators / general chemistry parameters	
pH, specific conductance, temperature, dissolved oxygen, redox potential, turbidity	Field parameters (in conjunction with low flow methods and flow-through cell)
total dissolved solids	EPA Method 160.1
chloride	EPA Method 325.1/325.3

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TABLE 2-4
SUMMARY OF QA/QC SAMPLING
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

QA / QC Sample Type	Frequency of Collection	Analytical Parameters
Trip Blank	1 per sample shipment / cooler	TCL VOCs
Field Blank	1 per 20 primary samples	all COIs
Duplicate	1 per 20 primary samples	all
MS / MSD	1 per 20 primary samples	TCL VOCs, TCL SVOCs, TAL metals

TABLE 3-1
SHALLOW ZONE GROUNDWATER ELEVATION DATA
QUARTERLY GROUDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Date			8/6/98		8/20/98		9/1/98		9/18/98		10/1/98		10/8/98	
Well ID	TOC Elev (ft-msl)	Ref.	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)
Shallow Wells														
MW-100	6.43	1	3.05	3.38	2.70	3.73	2.93	3.50	2.59	3.84	2.58	3.85	NM	NM
MW-101	8.74	1, 2	2.97	3.36	2.55	3.78	5.11	3.63	4.86	3.88	4.78	3.96	NM	NM
MW-102R	13.53	2	NI	NI	NI	NI	9.57	3.96	9.07	4.46	8.93	4.60	NM	NM
MW-103	9.66	1	6.06	3.60	5.54	4.12	5.77	3.89	5.31	4.35	5.15	4.51	5.16	4.50
MW-104	7.09	1	3.48	3.61	3.00	4.09	3.19	3.90	2.81	4.28	2.64	4.45	2.66	4.43
MW-105	8.46	1	4.50	3.96	4.10	4.36	4.88	3.58	4.52	3.94	4.30	4.16	4.52	3.94
MW-106	8.34	1	4.73	3.61	4.20	4.14	4.29	4.05	4.01	4.33	3.90	4.44	3.90	4.44
MW-108	7.05	1	5.96	1.09	5.86	1.19	6.02	1.03	5.09	1.96	5.08	1.97	NM	NM
MW-109	7.23	1	6.19	1.04	5.96	1.27	6.23	1.00	5.86	1.37	5.85	1.38	NM	NM
MW-110	10.29	1	7.06	3.23	6.76	3.53	7.01	3.28	6.64	3.65	6.61	3.68	NM	NM
MW-111	7.93	1, 2	8.21	2.93	7.73	3.41	4.35	3.58	4.03	3.90	3.99	3.94	NM	NM
MW-112	11.22	1	8.05	3.17	7.59	3.63	8.02	3.20	7.82	3.40	7.58	3.64	7.45	3.77
MW-113	11.34	2	NI	NI	NI	NI	8.53	2.81	8.44	2.90	8.38	2.96	8.51	2.83
MW-114	NI		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-115	9.39	2	6.21	3.18	5.46	3.93	6.16	3.23	5.73	3.66	5.32	4.07	5.38	4.01
MW-116	9.13	2	5.74	3.39	5.11	4.02	5.43	3.70	4.97	4.16	4.46	4.67	4.54	4.59
MW-117	21.01	2	17.26	3.75	16.62	4.39	16.89	4.12	16.48	4.53	16.40	4.61	16.38	4.63
MW-118	10.93	2	7.63	3.30	7.08	3.85	7.21	3.72	6.91	4.02	6.90	4.03	6.86	4.07
MW-119	7.70	2	5.54	2.16	5.18	2.52	4.72	2.98	4.25	3.45	4.25	3.45	NM	NM
MW-120	7.37	2	5.96	1.41	5.60	1.77	5.91	1.46	5.71	1.66	5.80	1.57	NM	NM
MW-121	7.62	2	6.72	0.90	6.48	1.14	6.69	0.93	6.37	1.25	6.36	1.26	NM	NM
MW-122	6.77	2	5.66	1.11	5.23	1.54	5.75	1.02	4.93	1.84	4.99	1.78	NM	NM
MW-123	6.49	2	4.98	1.51	4.72	1.77	5.10	1.39	4.52	1.97	4.48	2.01	NM	NM
MW-124	18.23	2	14.62	3.61	14.13	4.10	14.32	3.91	13.56	4.67	13.45	4.78	13.44	4.79
MW-125	8.53	2,8	6.88	1.65	6.70	1.83	6.77	1.76	11.22	2.31*	11.35	2.18*	NM	NM
MW-126	8.39	2,8	6.24	2.15	5.74	2.65	6.10	2.29	10.49	2.90*	10.45	2.94*	NM	NM
MW-127	8.88	2	7.84	1.04	7.48	1.40	7.83	1.05	7.26	1.62	7.11	1.77	NM	NM
MW-128	6.43	2	3.80	2.63	3.50	2.93	3.71	2.72	3.18	3.25	3.19	3.24	NM	NM
MW-129	19.98	2	16.44	3.54	15.88	4.10	16.04	3.94	15.60	4.38	15.45	4.53	15.42	4.56
MW-130	13.86	2	NI	NI	NI	NI	10.08	3.78	9.65	4.21	9.40	4.46	9.37	4.49
P-19	15.67	2	12.04	3.63	11.58	4.09	11.77	3.90	11.38	4.29	11.25	4.42	11.24	4.43
P-20	7.57	2	4.40	3.17	3.64	3.93	4.19	3.38	3.87	3.70	3.83	3.74	3.88	3.69
P-22	10.95	2	7.81	3.14	7.63	3.32	7.56	3.39	7.17	3.78	7.38	3.57	7.14	3.81
P-24	17.42	2,8	13.91	3.51	13.47	3.95	13.54	3.88	17.71	4.71*	17.65	4.77*	17.58	4.84*
P-25A	8.54	2	5.58	2.96	3.28	5.26	5.50	3.04	5.39	3.15	5.43	3.11	5.50	3.04
SWW-5 1R	11.41	2	NI	NI	NI	NI	7.76	3.65	7.45	3.96	7.42	3.99	7.27	4.14
SWW-25	14.45	2	10.53	3.92	10.25	4.20	10.55	3.90	10.06	4.39	9.96	4.49	10.02	4.43
W-9	8.22	2	5.68	3.91	4.00	5.59	4.42	3.80	3.97	4.25	4.74	3.48	4.68	3.54
W-12R	10.76	2	NI	NI	NI	NI	6.77	3.99	6.40	4.36	6.29	4.47	6.28	4.48
W-27	7.56	2	4.52	3.04	3.95	3.61	4.57	2.99	4.10	3.46	4.07	3.49	4.15	3.41

NOTES: 1) Surveyed by Casey & Keller, 1997
2) Surveyed by Casey & Keller, 1998
3) TOC = top of casing
4) ft-toc = feet below top of casing
5) ft-msl = feet above mean sea level
6) NI = well was not installed on measurement date
7) * = approximate values - wells were refurbished, survey data forthcoming
8) Approximate reference values for MW-125, MW-126, and P-24 are 13.53, 13.39, and 22.42 ft-msl, respectively, beginning with the 10/14/98 measurements. Survey data forthcoming
9) Reference elevations for P-24, MW-125, and MW-126 are 22.06, 13.70, and 13.61 ft-msl, starting on 12/4/98 when survey data was obtained
10) Reference elevations for groundwater quality monitoring wells were raised by 0.06 feet after November 24, due to the installation of sampling pumps

TABLE 3-1
SHALLOW ZONE GROUNDWATER ELEVATION DATA
QUARTERLY GROUDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Date			10/14/98		10/23/98		10/28/98		11/4/98		11/9/98		11/18/98	
Well ID	TOC Elev. (ft-msl)	Ref.	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)
Shallow Wells														
MW-100	6.43	1	2.69	3.74	NM	NM	2.92	3.51	NM	NM	2.72	3.71	NM	NM
MW-101	8.74	1, 2	4.98	3.76	NM	NM	4.94	3.80	NM	NM	4.82	3.92	NM	NM
MW-102R	13.53	2	8.49	5.04	NM	NM	8.89	4.64	NM	NM	9.07	4.46	NM	NM
MW-103	9.66	1	4.85	4.81	5.04	4.62	5.05	4.61	5.14	4.52	5.24	4.42	5.32	4.34
MW-104	7.09	1	2.25	4.84	2.52	4.57	2.55	4.54	2.60	4.49	2.72	4.37	2.78	4.31
MW-105	8.46	1	3.63	4.83	4.29	4.17	4.36	4.10	4.20	4.26	4.47	3.99	4.55	3.91
MW-106	8.34	1	3.55	4.79	3.69	4.65	3.68	4.66	3.77	4.57	3.91	4.43	4.04	4.30
MW-108	7.05	1	4.51	2.54	NM	NM	4.86	2.19	NM	NM	5.11	1.94	NM	NM
MW-109	7.23	1	5.30	1.93	NM	NM	5.74	1.49	NM	NM	5.93	1.30	NM	NM
MW-110	10.29	1	6.43	3.86	NM	NM	6.84	3.45	NM	NM	6.73	3.56	NM	NM
MW-111	7.93	1, 2	4.31	3.62	NM	NM	4.31	3.62	NM	NM	4.09	3.84	NM	NM
MW-112	11.22	1	7.41	3.81	7.70	3.52	7.49	3.73	7.60	3.62	7.65	3.57	7.85	3.37
MW-113	11.34	2	8.15	3.19	8.37	2.97	8.38	2.96	8.49	2.85	8.54	2.80	8.25	3.09
MW-114	NI		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-115	9.39	2	5.08	4.31	5.41	3.98	5.35	4.04	5.41	3.98	5.47	3.92	5.38	4.01
MW-116	9.13	2	4.21	4.92	4.67	4.46	4.64	4.49	4.77	4.36	4.84	4.29	4.88	4.25
MW-117	21.01	2	16.09	4.92	16.17	4.84	16.21	4.80	16.32	4.69	16.38	4.63	16.46	4.55
MW-118	10.93	2	6.54	4.39	6.64	4.29	6.58	4.35	6.60	4.33	6.82	4.11	6.96	3.97
MW-119	7.70	2	3.95	3.75	NM	NM	4.40	3.30	NM	NM	4.30	3.40	NM	NM
MW-120	7.37	2	5.39	1.98	NM	NM	5.77	1.60	NM	NM	5.51	1.86	NM	NM
MW-121	7.62	2	6.00	1.62	NM	NM	6.27	1.35	NM	NM	6.43	1.19	NM	NM
MW-122	6.77	2	4.37	2.40	NM	NM	4.71	2.06	NM	NM	4.98	1.79	NM	NM
MW-123	6.49	2	4.02	2.47	NM	NM	4.32	2.17	NM	NM	4.52	1.97	NM	NM
MW-124	18.23	2	13.09	5.14	13.29	4.94	13.23	5.00	13.39	4.84	13.47	4.76	13.57	4.66
MW-125	8.53	2,8	10.72	2.81	NM	NM	11.16	2.37	NM	NM	10.31	3.22	NM	NM
MW-126	8.39	2,8	9.89	3.50	NM	NM	10.56	2.83	NM	NM	10.26	3.13	NM	NM
MW-127	8.88	2	6.38	2.50	NM	NM	7.09	1.79	NM	NM	7.31	1.57	NM	NM
MW-128	6.43	2	2.86	3.57	NM	NM	3.39	3.04	NM	NM	3.30	3.13	NM	NM
MW-129	19.98	2	15.12	4.86	15.24	4.74	15.26	4.72	15.35	4.63	15.43	4.55	15.50	4.48
MW-130	13.86	2	9.08	4.78	9.32	4.54	9.34	4.52	9.39	4.47	9.46	4.40	9.52	4.34
P-19	15.67	2	10.92	4.75	11.09	4.58	11.06	4.61	11.19	4.48	11.31	4.36	11.38	4.29
P-20	7.57	2	3.43	4.14	3.59	3.98	3.63	3.94	3.74	3.83	3.79	3.78	3.72	3.85
P-22	10.95	2	6.74	4.21	6.92	4.03	6.75	4.20	6.98	3.97	7.03	3.92	6.99	3.96
P-24	17.42	2,8	17.32	5.10	17.36	5.06	17.33	5.09	17.49	4.93	17.56	4.86	17.60	4.82
P-25A	8.54	2	5.04	3.50	5.25	3.29	5.37	3.17	5.46	3.08	5.53	3.01	5.50	3.04
SWW-5.1R	11.41	2	7.15	4.26	7.21	4.20	7.23	4.18	7.38	4.03	7.42	3.99	7.49	3.92
SWW-25	14.45	2	9.73	4.72	9.84	4.61	9.89	4.56	9.86	4.59	10.04	4.41	10.15	4.30
W-9	8.22	2	4.26	3.96	4.45	3.77	4.30	3.92	4.40	3.82	4.40	3.82	4.41	3.81
W-12R	10.76	2	6.00	4.76	6.07	4.69	6.08	4.68	6.12	4.64	6.26	4.50	6.28	4.48
W-27	7.56	2	3.49	4.07	3.70	3.86	3.58	3.98	3.63	3.93	3.67	3.89	4.52	3.04

NOTES
1) Surveyed by Casey & Keller, 1997
2) Surveyed by Casey & Keller, 1998
3) TOC = top of casing
4) ft-toc = feet below top of casing
5) ft-msl = feet above mean sea level
6) NI = well was not installed on measurement date
7) * = approximate values - wells were refurbished, survey data forthcoming
8) Approximate reference values for MW-125, MW-126, and P-24 are 13.53, 13.39, and 22.42 ft msl, respectively, beginning with the 10/14/98 measurements. Survey data forthcoming
9) Reference elevations for P-24, MW-125, and MW-126 are 22.06, 13.70, and 13.61 ft-msl, starting on 12/4/98 when survey data was obtained
10) Reference elevations for groundwater quality monitoring wells were raised by 0.06 feet after November 24, due to the installation of sampling pumps

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TABLE 3-1
SHALLOW ZONE GROUNDWATER ELEVATION DATA
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Date.			11/24/98		12/4/98		12/8/98		12/17/98		12/22/98		12/30/98	
Well ID	TOC Elev (ft-msl)	Ref	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)
Shallow Wells														
MW-100	6.43	1	2.66	3.77	NM	NM	2.59	3.84	NM	NM	2.62	3.81	NM	NM
MW-101	8.74	1, 2	7.46	1.28	NM	NM	4.66	4.08	NM	NM	4.68	4.06	NM	NM
MW-102R	13.53	2	6.22	7.37	NM	NM	9.20	4.39	NM	NM	9.10	4.49	NM	NM
MW-103	9.66	1	5.40	4.32	5.35	4.37	5.35	4.37	5.25	4.47	5.35	4.37	5.20	4.52
MW-104	7.09	1	2.86	4.29	2.80	4.35	2.81	4.34	2.71	4.44	2.75	4.40	2.64	4.51
MW-105	8.46	1	4.65	3.87	4.60	3.92	4.56	3.96	4.58	3.94	4.59	3.93	4.37	4.15
MW-106	8.34	1	4.00	4.40	4.02	4.38	3.99	4.41	3.92	4.48	3.97	4.43	3.89	4.51
MW-108	7.05	1	5.13	1.98	NM	NM	5.02	2.09	NM	NM	5.03	2.08	NM	NM
MW-109	7.23	1	5.87	1.42	NM	NM	5.80	1.49	NM	NM	5.64	1.65	NM	NM
MW-110	10.29	1	6.78	3.57	NM	NM	6.71	3.64	NM	NM	6.72	3.63	NM	NM
MW-111	7.93	1, 2	4.02	3.91	NM	NM	3.97	3.96	NM	NM	3.98	3.95	NM	NM
MW-112	11.22	1	7.55	3.73	7.22	4.06	7.15	4.13	7.33	3.95	7.36	3.92	7.16	4.12
MW-113	11.34	2	8.26	3.14	8.25	3.15	8.39	3.01	8.46	2.94	8.51	2.89	8.06	3.34
MW-114	NI		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-115	9.39	2	5.31	4.08	5.04	4.35	5.95	3.44	4.81	4.58	4.94	4.45	4.79	4.60
MW-116	9.13	2	4.93	4.26	4.82	4.37	4.77	4.42	4.69	4.50	4.66	4.53	4.53	4.66
MW-117	21.01	2	16.50	4.57	16.50	4.57	16.65	4.42	16.32	4.75	16.41	4.66	16.28	4.79
MW-118	10.93	2	7.07	3.92	6.77	4.22	6.65	4.34	6.45	4.54	6.59	4.40	6.52	4.47
MW-119	7.70	2	4.29	3.41	NM	NM	4.26	3.44	NM	NM	4.33	3.37	NM	NM
MW-120	7.37	2	5.48	1.95	NM	NM	5.38	2.05	NM	NM	5.52	1.91	NM	NM
MW-121	7.62	2	6.24	1.44	NM	NM	6.40	1.28	NM	NM	6.34	1.34	NM	NM
MW-122	6.77	2	4.98	1.79	NM	NM	4.85	1.92	NM	NM	4.89	1.88	NM	NM
MW-123	6.49	2	4.49	2.00	NM	NM	4.43	2.06	NM	NM	4.46	2.03	NM	NM
MW-124	18.23	2	13.64	4.65	13.60	4.69	13.53	4.76	13.50	4.79	13.51	4.78	13.46	4.83
MW-125	8.53	2,8	11.09	2.44	NM	NM	11.27	2.43	NM	NM	11.38	2.32	NM	NM
MW-126	8.39	2,8	10.48	2.91	NM	NM	10.55	3.06	NM	NM	10.62	2.99	NM	NM
MW-127	8.88	2	7.25	1.63	NM	NM	7.23	1.65	NM	NM	7.18	1.70	NM	NM
MW-128	6.43	2	6.31	0.12	NM	NM	3.28	3.15	NM	NM	3.34	3.09	NM	NM
MW-129	19.98	2	15.57	4.47	15.52	4.52	15.43	4.61	15.40	4.64	15.42	4.62	15.35	4.69
MW-130	13.86	2	9.59	4.33	9.48	4.44	9.40	4.52	9.36	4.56	9.37	4.55	9.31	4.61
P-19	15.67	2	11.42	4.25	11.48	4.26	11.40	4.27	11.37	4.37	11.40	4.27	11.34	4.33
P-20	7.57	2	3.48	4.09	3.26	4.31	3.35	4.22	3.17	4.40	3.26	4.31	3.12	4.45
P-22	10.95	2	6.76	4.19	6.62	4.33	6.68	4.27	6.54	4.41	6.67	4.28	6.43	4.52
P-24	17.42	2,8	17.66	4.76	17.63	4.41	17.65	4.41	17.56	4.50	17.61	4.45	17.58	4.48
P-25A	8.54	2	5.54	3.06	5.46	3.14	5.41	3.19	5.42	3.18	5.53	3.07	4.98	3.62
SWW-5.1R	11.41	2	7.52	3.89	7.47	3.94	7.48	3.93	7.11	4.30	7.11	4.30	7.07	4.34
SWW-25	14.45	2	10.18	4.27	10.16	4.35	10.13	4.32	10.05	4.46	10.12	4.33	9.98	4.47
W-9	8.22	2	3.98	4.24	3.82	4.40	3.88	4.34	3.77	4.45	3.90	4.32	3.74	4.48
W-12R	10.76	2	6.39	4.37	6.36	4.46	6.30	4.46	6.28	4.54	6.37	4.39	6.23	4.53
W-27	7.56	2	3.48	4.08	3.10	4.46	2.90	4.66	3.05	4.51	3.07	4.49	2.92	4.64

NOTES: 1) Surveyed by Casey & Keller, 1997
2) Surveyed by Casey & Keller, 1998
3) TOC = top of casing
4) ft-toc = feet below top of casing
5) ft-msl = feet above mean sea level
6) NI = well was not installed on measurement date
7) * = approximate values - wells were refurbished, survey data forthcoming
8) Approximate reference values for MW-125, MW-126, and P-24 are 13.53, 13.39, and 22.42 ft-msl, respectively, beginning with the 10/14/98 measurements. Survey data forthcoming
9) Reference elevations for P-24, MW-125, and MW-126 are 22.06, 13.70, and 13.61 ft-msl, starting on 12/4/98 when survey data was obtained
10) Reference elevations for groundwater quality monitoring wells were raised by 0.06 feet after November 24, due to the installation of sampling pumps

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TABLE 3-2
DNAPL THICKNESS DATA
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Date:	8/5/98			8/19/98			9/1/98			9/18/98		
Well ID	Depth to DNAPL (ft-	Total Depth (ft-toc)	DNAPL Thickness (ft)	Depth to DNAPL (ft-	Total Depth (ft-toc)	DNAPL Thickness (ft)	Depth to DNAPL (ft-	Total Depth (ft-toc)	DNAPL Thickness (ft)	Depth to DNAPL (ft-	Total Depth (ft-toc)	DNAPL Thickness (ft)
Shallow Zone												
MW-112	NP	14.95	NP	NP	14.89	NP	NP	NM	NP	NP	NM	NP
MW-115	11.63	15.73	4.10	11.74	15.67	3.93	11.71	15.67	3.96	11.72	15.67	3.95
MW-116	NP	12.75	NP	NP	12.62	NP	NP	12.61	NP	NP	12.61	NP
MW-117	NP	30.17	NP	NP	30.00	NP	NP	30.00	NP	NP	30.00	NP
MW-118	NP	16.98	NP	NP	16.85	NP	NP	16.85	NP	NP	16.85	NP
MW-129	NP	22.51	NP	NM	NM	NM	NP	NM	NP	NP	NM	NP
MW-130	NI	NI	NI	NI	NI	NI	NP	16.87	NP	NP	16.87	NP
P-20	10.17	17.34	7.17	9.41	17.29	7.88	10.29	17.29	7.00	9.05	17.29	8.24
P-22	NP	16.24	NP	NP	16.20	NP	NP	16.27	NP	NP	16.07	NP
P-24	NP	25.61	NP	NP	25.42	NP	NP	25.42	NP	NP	30.26	NP
SWW-5.1R	NI	NI	NI	NI	NI	NI	NP	13.77	NP	NP	13.95	NP
W-9	*	10.71	*	*	10.75	*	*	9.41	*	*	9.16	*
W-27	10.75	16.43	5.68	10.93	16.45	5.52	10.92	16.45	5.53	10.72	16.45	5.73
Deep Zone												
C-3	NP	80.59	NP	NM	NM	NM	NM	NM	NM	NP	80.59	NP
SWW-6.5	NP	63.65	NP	NP	63.65	NP	NP	61.50	NP	NP	61.62	NP
SWW-7.5	NP	82.45	NP	NP	82.45	NP	NP	80.75	NP	NP	80.78	NP
SWW-9	NP	77.32	NP	NP	77.32	NP	NP	76.09	NP	NP	76.27	NP
W-13R	NP	80.50	NP	NP	80.50	NP	NP	80.40	NP	NP	80.23	NP
W-25	NM	NM	NM	NP	68.80	NP	NP	68.83	NP	NP	68.83	NP
W-29	NP	74.77	NP	NP	74.68	NP	NP	NM	NP	NP	74.87	NP

NOTES:
1) ft-toc = feet below top of casing
2) NP = no product detected
3) NI = well was not installed on measurement date
4) * = DNAPL was observed throughout water column
5) Monitoring well W-9 was refurbished before 9/1/98 gauging event
6) NM = not measured

TABLE 3-2
DNAPL THICKNESS DATA
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Date:	10/1/98			10/14/98			10/28/98			11/9/98		
Well ID	Depth to DNAPL (ft-	Total Depth (ft-toc)	DNAPL Thickness (ft)	Depth to DNAPL (ft-	Total Depth (ft-toc)	DNAPL Thickness (ft)	Depth to DNAPL (ft-	Total Depth (ft-toc)	DNAPL Thickness (ft)	Depth to DNAPL (ft-toc)	Total Depth (ft-toc)	DNAPL Thickness (ft)
Shallow Zone												
MW-112	NP	NM	NP	NP	NM	NP	NP	NM	NP	NP	14.97	NP
MW-115	11.51	15.67	4.16	11.39	15.67	4.28	11.67	15.67	4.00	11.68	15.67	3.99
MW-116	NP	NM	NP	NP	NM	NP	NP	NM	NP	NP	12.77	NP
MW-117	NP	NM	NP	NP	NM	NP	NP	NM	NP	NP	30.14	NP
MW-118	NP	NM	NP	NP	NM	NP	NP	NM	NP	NP	17.01	NP
MW-129	NP	NM	NP	NP	NM	NP	NP	NM	NP	NP	22.51	NP
MW-130	NP	NM	NP	NP	NM	NP	NP	NM	NP	NP	17.06	NP
P-20	9.80	17.29	7.49	9.23	17.29	8.06	9.76	17.29	7.53	9.95	17.29	7.34
P-22	NP	NM	NP	NP	NM	NP	NP	NM	NP	NP	16.25	NP
P-24	NP	NM	NP	NP	NM	NP	NP	NM	NP	NP	30.14	NP
SWW-5.1R	NP	NM	NP	NP	NM	NP	NP	NM	NP	NP	13.92	NP
W-9	8.25	9.25	1.00	7.60	9.29	1.69	7.43	9.29	1.86	8.40	9.29	0.89
W-27	10.77	16.45	5.68	10.67	16.45	5.78	10.63	16.45	5.82	10.72	16.45	5.73
Deep Zone												
C-3	NP	NM	NP	NP	NM	NP	NP	NM	NP	NP	81.71	NP
SWW-6.5	NP	NM	NP	NP	NM	NP	NP	NM	NP	NP	61.59	NP
SWW-7.5	NP	NM	NP	NP	NM	NP	NP	NM	NP	NP	80.91	NP
SWW-9	NP	NM	NP	NP	NM	NP	NP	NM	NP	NP	76.21	NP
W-13R	NP	NM	NP	NP	NM	NP	NP	NM	NP	NP	80.47	NP
W-25	NM	NM	NM	NM	NM	NM	NP	NM	NP	NP	68.98	NP
W-29	NP	NM	NP	NP	NM	NP	NP	NM	NP	NP	74.79	NP

NOTES:
1) ft-toc = feet below top of casing
2) NP = no product detected
3) NI = well was not installed on measurement date
4) * = DNAPL was observed throughout water column
5) Monitoring well W-9 was refurbished before 9/1/98 gauging event
6) NM = not measured

TABLE 3-2
DNAPL THICKNESS DATA
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Date:	11/24/98			12/8/98			12/22/98		
Well ID	Depth to DNAPL (ft-toc)	Total Depth (ft-toc)	DNAPL Thickness (ft)	Depth to DNAPL (ft-toc)	Total Depth (ft-toc)	DNAPL Thickness (ft)	Depth to DNAPL (ft-toc)	Total Depth (ft-toc)	DNAPL Thickness (ft)
Shallow Zone									
MW-112	NP	NM	NP	NP	NP	NP	NP	NP	NP
MW-115	11.59	15.67	4.08	11.72	15.67	3.95	11.60	15.60	4.00
MW-116	NP	NM	NP	NP	NP	NP	NP	NP	NP
MW-117	NP	NM	NP	NP	NP	NP	NP	NP	NP
MW-118	NP	NM	NP	NP	NP	NP	NP	NP	NP
MW-129	NP	NM	NP	NP	NP	NP	NP	NP	NP
MW-130	NP	NM	NP	NP	NP	NP	NP	NP	NP
P-20	9.61	17.29	7.68	9.70	17.29	7.59	9.66	17.29	7.63
P-22	NP	NM	NP	NP	NP	NP	NP	NP	NP
P-24	NP	NM	NP	NP	NP	NP	NP	NP	NP
SWW-5.1R	NP	NM	NP	NP	NP	NP	NP	NP	NP
W-9	9.13	9.29	0.16	12.36	13.95	1.59	8.98	15.63	6.65
W-27	10.67	16.45	5.78	10.55	16.45	5.90	11.73	16.33	4.60
Deep Zone									
C-3	NP	NM	NP	NP	NP	NP	NP	NP	NP
SWW-6.5	NP	NM	NP	NP	NP	NP	NP	NP	NP
SWW-7.5	NP	NM	NP	NP	NP	NP	NP	NP	NP
SWW-9	NP	NM	NP	NP	NP	NP	NP	NP	NP
W-13R	NM	NM	NP	NP	NP	NP	NP	NP	NP
W-25	NP	NM	NP	NM	NP	NM	NM	NP	NM
W-29	NP	NM	NP	NP	NP	NP	NP	NP	NP

NOTES:
1) ft-toc = feet below top of casing
2) NP = no product detected
3) NI = well was not installed on measurement date
4) * = DNAPL was observed throughout water column
5) Monitoring well W-9 was refurbished before 9/1/98 gauging event
6) NM = not measured

Table 3-3 Summary of Mean, Number of Samples, and Range of Concentrations for Field, General Chemisrty and Metals in the Shallow and Deep Groundwater Zones

Parameter Name	Units	Mean	N	Range Min	Range Max
Groundwater Zone: SHALLOW					
Well Type: Compliance					
Alkalinity, Total	ug/L as CaCO	356,250.00	8	170,000.00	760,000.00
Calcium	ug/L	130,875.00	8	97,000.00	160,000.00
Carbon Dioxide	mg/L	466.25	8	172.00	849.00
Chloride	mg/L	1,166.50	8	62.00	3,700.00
Cyanide, Total	ug/L	74.57	7	14.00	390.00
Dissolved Oxygen (DO)	mg/L	2.11	8	0.90	4.23
Iron	ug/L	17,725.00	8	3,800.00	43,000.00
Iron (Ferrous)	mg/L	10.42	7	0.54	35.70
Magnesium	ug/L	40,375.00	8	21,000.00	61,000.00
Manganese	ug/L	645.00	8	190.00	1,400.00
Methane	mg/L	2.59	8	0.12	4.94
Oxidation Reduction Potential	mV	-86.81	8	-212.20	8.90
pH	SU	6.88	8	6.43	8.05
Potassium	ug/L	60,375.00	8	15,000.00	260,000.00
Sodium	ug/L	446,250.00	8	120,000.00	1,500,000.00
Specific Conductivity	uS	3.46	8	1.50	9.00
Sulfate	ug/L	158,350.00	8	5,800.00	350,000.00
Turbidity	NTU	152.84	8	0.20	1,083.00
Well Type: Monitoring					
Alkalinity, Total	ug/L as CaCO	441,111.11	18	60,000.00	1,800,000.00
Calcium	ug/L	109,355.56	18	5,400.00	210,000.00
Carbon Dioxide	mg/L	706.06	18	120.00	1,600.00
Chloride	mg/L	1,818.24	17	60.00	8,800.00
Cyanide, Free	ug/L	10.00	1	10.00	10.00
Cyanide, Total	ug/L	87.31	13	17.00	300.00
Dissolved Oxygen (DO)	mg/L	4.77	17	0.10	15.41
Iron	ug/L	30,270.56	18	270.00	85,000.00
Iron (Ferrous)	mg/L	25.76	15	0.15	66.70
Magnesium	ug/L	82,888.89	18	16,000.00	550,000.00
Manganese	ug/L	1,148.33	18	40.00	3,300.00
Methane	mg/L	6.23	18	0.15	17.50
Oxidation Reduction Potential	mV	-90.36	17	-394.50	107.10
pH	SU	6.62	17	5.61	8.74
Potassium	ug/L	47,000.00	18	6,000.00	170,000.00
Sodium	ug/L	813,833.33	18	39,000.00	4,500,000.00
Specific Conductivity	uS	6.77	17	0.82	26.80
Sulfate	ug/L	222,735.29	17	2,100.00	1,100,000.00
Turbidity	NTU	227.36	17	0.00	1,273.00

Parameter Name	Units	Mean	N	Range Min	Range Max
Groundwater Zone: DEEP					
Well Type: Compliance					
Calcium	ug/L	541,857.14	7	83,000.00	2,500,000.00
Chloride	mg/L	1,790.00	7	550.00	5,100.00
Cyanide, Total	ug/L	12.50	2	10.00	15.00
Dissolved Oxygen (DO)	mg/L	4.80	7	0.76	9.17
Iron	ug/L	26,058.33	6	350.00	130,000.00
Magnesium	ug/L	128,166.67	6	17,000.00	360,000.00
Manganese	ug/L	880.00	1	880.00	880.00
Oxidation Reduction Potential	mV	10.76	7	-108.00	139.10
pH	SU	7.63	7	6.81	11.34
Potassium	ug/L	34,983.33	6	7,500.00	120,000.00
Sodium	ug/L	882,857.14	7	180,000.00	2,700,000.00
Solids, Total Dissolved	mg/L	2,760.00	7	920.00	7,000.00
Specific Conductivity	uS	5.74	7	1.50	14.80
Turbidity	NTU	540.26	7	3.80	1,742.10

safety-kleen

TABLE 3-4. Summary of Shallow Zone Compliance Wells, 4th Quarter 1998

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater
Parameter Type : Field/General Chemistry Units : See Below

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Units	Well Location W-102	MW-103	MW-104	W-12R	MW-106	MW-113	P-19	SWW-25
Alkalinity, Total		NA	ug/L as CaCO3	760000	260000	210000	310000	360000	490000	290000	170000
Carbon Dioxide		NA	mg/L	849	577	172	486	558	483	367	238
Chloride	16887-00-6	NA	mg/L	2400	1100	62	470	720	270	610	3700
Cyanide, Free	57-12-5	1	ug/L	<10	<10	<10	<10	<10	<10	<10	<10
Cyanide, Total	57-12-5	1	ug/L	390	15	14	29	35	15	<10	24
Dissolved Oxygen (DO)		NA	mg/L	2.59	0.9	2.09	1.1	4.23	1.8	1.01	3.2*
Iron (Ferrous)	15438-31-0	NA	mg/L	16.5	35.7	0.54	4.03	5.65	<0.1	6.43	4.06
Methane	74-82-8	NA	mg/L	3.99	0.578	1.51	4.21	4.94	3.87	1.48	0.123
Nitrogen, Nitrate	14797-55-8	NA	ug/L	<100	<100	<100	<100	<100	120	110	450
Nitrogen, Nitrite	14797-65-0	NA	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Nitrite and Nitrate		NA	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.12	0.11	0.45
Oxidation Reduction Potential		NA	mV	-120	-50.3	-113.8	-87.1	-53.4	-212.2	-66.6	8.9
pH		NA	SU	7.09	6.43	7.21	6.49	6.54	8.05	6.64	6.59
Specific Conductivity		NA	uS	9	4.7	1.6	2.3	3.4	1.5	2.66	2.5
Sulfate	14808-79-8	NA	ug/L	52000	220000	170000	89000	260000	5800	120000	350000
Temperature		NA	degree C	15.2	15.87	11.7	14.7	15.8	15.57	9.2	10.33
Turbidity		NA	NTU	1083	0.8	0.2	75.4	52.4	7.2	0.5	3.2

Note: NA = not available for this parameter. * = DO sensor problems, readings may not be accurate. + = Turbidity sensor problems, readings may not be accurate.
Data Qualifiers: M = duplicate precision not met.

SK safety-kleen

TABLE 3-4. Summary of Shallow Zone Compliance Wells, 4th Quarter 1998

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater

Parameter Type : Metals, Total Units : ug/L

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location							
			W-102R	MW-103	MW-104	W-12R	MW-106	MW-113	P-19	SWW-25
Aluminum	7429-90-5	NA	<200	<200	<200	200	<200	<200	<200	<200
Antimony	7440-36-0	4300	<60	<60	<60	<60	<60	<60	<60	<60
Arsenic	7440-38-2	0.136	27	<10	<10	45	<10	<10	<10	23
Barium	7440-39-3	NA	300	270	<200	<200	<200	<200	<200	<200
Beryllium	7440-41-7	NA	<5	<5	<5	<5	<5	<5	<5	<5
Cadmium	7440-43-9	NA	5	<5	<5	<5	<5	<5	<5	<5
Calcium	7440-70-2	NA	97000	130000	120000	120000	160000	100000	160000	160000
Chromium	7440-47-3	3230	14	<10	<10	<10	<10	<10	<10	11
Cobalt	7440-48-4	NA	<50	<50	<50	<20	<20	<50	<50	<50
Copper	7440-50-8	NA	130	<25	<25	<25	<25	<25	<25	<25
Iron	7439-89-6	NA	43000	36000	3800	16000	9700	4500	21000	7800
Lead	7439-92-1	NA	4.1	<3	<3	<3	<3	<3	<3	<3
Magnesium	7439-95-4	NA	35000	55000	21000	38000	61000	26000	51000	36000
Manganese	7439-96-5	100	1400	970	190	350	340	1100	540	270
Mercury	7439-97-6	0.146	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nickel	7440-02-0	3900	53	<40	<40	<40	<40	<40	<40	130
Potassium	7440-09-7	NA	260000	58000	15000	30000	41000	25000	15000	39000
Selenium	7782-49-2	NA	<5	<5	<5	<5	<5	<5	<5	<5
Silver	7440-22-4	NA	<10	<10	<10	<10	<10	<10	<10	<10
Sodium	7440-23-5	NA	1500000	640000	180000	250000	420000	120000	230000	230000
Thallium	7440-28-0	6.22	<10	<10	<10	<10	<10	<10	<10	<10
Vanadium	7440-62-2	NA	<50	<50	<50	<50	<50	<20	<50	<50
Zinc	7440-66-6	NA	24	<20	<20	<20	<20	<20	370	58

Note: NA = not available for this parameter

Data Qualifiers: M = Duplicate precision not met.

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TABLE 3-4. Summary of Shallow Zone Compliance Wells, 4th Quarter 1998 SK Services (East) L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater

Parameter Type : Organics, Semi-Volatile Units : ug/L

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	W-102R	MW-103	MW-104	W-12R	MW-106	MW-113	P-19	SWW-25
1,2,4-Trichlorobenzene	120-82-1	113	<20	<10	<10	<10	<10	<10	<10	<10
1,2-Dichlorobenzene	95-50-1	16500	<20	<10	<10	<10	<10	<10	<10	<10
1,3-Dichlorobenzene	541-73-1	22200	<20	<10	<10	<10	<10	<10	<10	<10
1,4-Dichlorobenzene	106-46-7	3159	<20	<10	<10	<10	<10	<10	<10	<10
2,4,5-Trichlorophenol	95-95-4	9790	<50	<25	<25	<25	<25	<25	<25	<25
2,4,6-Trichlorophenol	88-06-2	6.53	<20	<10	<10	<10	<10	<10	<10	<10
2,4-Dichlorophenol	120-83-2	794	<20	<10	<10	<10	<10	<10	<10	<10
2,4-Dimethylphenol	105-67-9	NA	<20	<10	<10	<10	<10	<10	<10	<10
2,4-Dinitrophenol	51-28-5	14000	<50	<25	<25	<25	<25	<25	<25	<25
2,4-Dinitrotoluene	121-14-2	9.1	<20	<10	<10	<10	<10	<10	<10	<10
2,6-Dinitrotoluene	606-20-2	NA	<20	<10	<10	<10	<10	<10	<10	<10
2-Chloronaphthalene	91-58-7	NA	<20	<10	<10	<10	<10	<10	<10	<10
2-Chlorophenol	95-57-8	402	<20	<10	<10	<10	<10	<10	<10	<10
2-Methylnaphthalene	91-57-6	NA	<20	<10	<10	<10	<10	12	<10	<10
2-Methylphenol	95-48-7	NA	<20	<10	<10	<10	<10	<10	<10	<10
2-Nitroaniline	88-74-4	NA	<50	<25	<25	<25	<25	<25	<25	<25
2-Nitrophenol	88-75-5	NA	<20	<10	<10	<10	<10	<10	<10	<10
3,3'-Dichlorobenzidine	91-94-1	0.0767	<20	<10	<10	<10	<10	<10	<10	<10
3-Nitroaniline	99-09-2	NA	<50	<25	<25	<25	<25	<25	<25	<25
4,6-Dinitro-2-methylphenol	534-52-1	765	<50	<25	<25	<25	<25	<25	<25	<25
4-Bromophenyl phenyl ether	101-55-3	NA	<20	<10	<10	<10	<10	<10	<10	<10
4-Chloro-3-Methylphenol	59-50-7	NA	<20	<10	<10	<10	<10	<10	<10	<10
4-Chloroaniline	106-47-8	NA	<20	<10	<10	<10	<10	<10	<10	<10
4-Chlorophenyl phenyl ether	7005-72-3	NA	<20	<10	<10	<10	<10	<10	<10	<10
4-Methylphenol	106-44-5	NA	41	<10	<10	<10	<10	<10	<10	<10
4-Nitroaniline	100-01-6	NA	<50	<25	<25	<25	<25	<25	<25	<25
4-Nitrophenol	100-02-7	NA	<50	<25	<25	<25	<25	<25	<25	<25
Acenaphthene	83-32-9	NA	<20	<10	12	<10	<10	<10	<10	<10
Acenaphthylene	208-96-8	NA	<20	<10	<10	<10	<10	10	<10	<10
Anthracene	120-12-7	108000	<20	<10	<10	<10	<10	<10	<10	<10
Benzo(a)Anthracene	56-55-3	0.031	<20	<10	<10	<10	<10	<10	<10	<10
Benzo(a)Pyrene	50-32-8	0.031	<20	<10	<10	<10	<10	<10	<10	<10
Benzo(b)Fluoranthene	205-99-2	NA	<20	<10	<10	<10	<10	<10	<10	<10
Benzo(g,h,i)perylene	191-24-2	NA	<20	<10	<10	<10	<10	<10	<10	<10
Benzo(k)Fluoranthene	207-08-9	0.031	<20	<10	<10	<10	<10	<10	<10	<10

Note: NA = not available for this parameter

Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to dilution factor and may be exaggerated.

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location							
			W-102R	MW-103	MW-104	W-12R	MW-106	MW-113	P-19	SWW-25
Bis(2-Chloroethoxy)Methane	111-91-1	NA	<20	<10	<10	<10	<10	<10	<10	<10
Bis(2-Chloroethyl) Ether	111-44-4	1.4	<20	<10	<10	<10	<10	<10	<10	<10
Bis(2-Chloroisopropyl) Ether	108-60-1	170000	<20	<10	<10	<10	<10	<10	<10	<10
Bis(2-Ethylhexyl) Phthalate	117-81-7	5.92	<20	<10	<10	<10	<10	<10	<10	<10
Butyl Benzyl Phthalate	85-68-7	416	<20	<10	<10	<10	<10	<10	<10	<10
Carbazole	86-74-8	NA	<20	<10	<10	<10	<10	22	<10	<10
Chrysene	218-01-9	0.031	<20	<10	<10	<10	<10	<10	<10	<10
Di-N-Butyl phthalate	84-74-2	15700	<20	<10	<10	<10	<10	<10	<10	<10
Di-N-Octyl phthalate	117-84-0	NA	<20	<10	<10	<10	<10	<10	<10	<10
Dibenz(a,h)anthracene	53-70-3	0.031	<20	<10	<10	<10	<10	<10	<10	<10
Dibenzofuran	132-64-9	NA	<20	<10	<10	<10	<10	<10	<10	<10
Diethyl phthalate	84-66-2	111000	<20	<10	<10	<10	<10	<10	<10	<10
Dimethyl phthalate	131-11-3	2900000	<20	<10	<10	<10	<10	<10	<10	<10
Fluoranthene	206-44-0	393	<20	<10	<10	<10	<10	<10	<10	<10
Fluorene	86-73-7	NA	<20	<10	<10	<10	<10	13	<10	<10
Hexachlorobenzene	118-74-1	0.000775	<20	<10	<10	<10	<10	<10	<10	<10
Hexachlorobutadiene	87-68-3	NA	<20	<10	<10	<10	<10	<10	<10	<10
Hexachlorocyclopentadiene	77-47-4	17000	<20	<10	<10	<10	<10	<10	<10	<10
Hexachloroethane	67-72-1	12.4	<20	<10	<10	<10	<10	<10	<10	<10
Indeno(1,2,3-c,d)pyrene	193-39-5	0.031	<20	<10	<10	<10	<10	<10	<10	<10
Isophorone	78-59-1	NA	<20	<10	<10	<10	<10	<10	<10	<10
N-Nitroso-di-N-propylamine	621-64-7	NA	<20	<10	<10	<10	<10	<10	<10	<10
N-Nitrosodiphenylamine	86-30-6	16.2	<20	<10	<10	<10	<10	<10	<10	<10
Naphthalene	91-20-3	NA	<20	<10	<10	<10	<10	26	<10	<10
Nitrobenzene	98-95-3	1900	<20	<10	<10	<10	<10	<10	<10	<10
Pentachlorophenol	87-86-5	8.2	<50	<25	<25	<25	<25	<25	<25	<25
Phenanthrene	85-01-8	NA	<20	<10	<10	<10	<10	20	<10	<10
Phenol	108-95-2	4600000	190	<10	<10	<10	<10	13	<10	<10
Pyrene	129-00-0	8970	<20	<10	<10	<10	<10	<10	<10	<10

Note: NA = not available for this parameter

Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to dilution factor and may be exaggerated.

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safety-kleen

TABLE 3-4. Summary of Shallow Zone Compliance Wells, 4th Quarter 1998

SK Services (East), L.C.

Laboratory : SK (ENCOTEC)　　Matrix : Groundwater

Parameter Type : Organic, Volatile　　Units : ug/L

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location							
			W-102R	MW-103	MW-104	W-12R	MW-106	MW-113	P-19	SWW-25
1,1,1-Trichloroethane	71-55-6	NA	<10	<10	<10	<10	<10	<10	<10	<10
1,1,2,2-Tetrachloroethane	79-34-5	NA	<10	<10	<10	<10	<10	<10	<10	<10
1,1,2-Trichloroethane	79-00-5	NA	<10	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethane	75-34-3	NA	<10	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	75-35-4	NA	<10	<10	<10	<10	<10	<10	<10	<10
1,2-Dichloroethane	107-06-2	99	<10	<10	<10	<10	<10	<10	<10	<10
1,2-Dichloropropane	78-87-5	NA	<10	<10	<10	<10	<10	<10	<10	<10
2-Butanone (MEK)	78-93-3	NA	21	<10	<10	<10	<10	<10	<10	<10
2-Hexanone	591-78-6	NA	<10	<10	<10	<10	<10	<10	<10	<10
4-Methyl-2-Pentanone (MIBK)	108-10-1	NA	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	67-64-1	NA	120	<10	<10	<10	<10	22	<10	<10
Benzene	71-43-2	71	<10	<10	<10	<10	<10	<10	<10	<10
Bromodichloromethane	75-27-4	22	<10	<10	<10	<10	<10	<10	<10	<10
Bromoform	75-25-2	360	<10	<10	<10	<10	<10	<10	<10	<10
Bromomethane	74-83-9	NA	<10	<10	<10	<10	<10	<10	<10	<10
Carbon Disulfide	75-15-0	NA	<10	<10	<10	<10	<10	<10	<10	<10
Carbon tetrachloride	56-23-5	6.31	<10	<10	<10	<10	<10	<10	<10	<10
Chlorobenzene	108-90-7	21000	<10	<10	<10	<10	<10	<10	<10	<10
Chloroethane	75-00-3	NA	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	67-66-3	470	<10	<10	<10	<10	<10	<10	<10	<10
Chloromethane	74-87-3	NA	<10	<10	<10	<10	<10	<10	<10	<10
cis-1,3-Dichloropropene	10061-01-5	NA	<10	<10	<10	<10	<10	<10	<10	<10
Dibromochloromethane	124-48-1	NA	<10	<10	<10	<10	<10	<10	<10	<10
Ethylbenzene	100-41-4	27900	<10	<10	<10	<10	<10	<10	<10	<10
Methylene chloride	75-09-2	1600	<10	<10	<10	<10	<10	<10	<10	<10
Styrene	100-42-5	NA	<10	<10	<10	<10	<10	<10	<10	<10
Tetrachloroethene	127-18-4	4.29	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	108-88-3	200000	<10	<10	<10	<10	<10	<10	<10	<10
total 1,2-Dichloroethene	540-59-0	NA	<10	<10	<10	<10	<10	<10	<10	<10
Total Xylenes	1330-20-7	NA	<10	<10	<10	<10	<10	<10	<10	<10
trans-1,3-Dichloropropene	10061-02-6	NA	<10	<10	<10	<10	<10	<10	<10	<10
Trichloroethene	79-01-6	81	<10	<10	<10	<10	<10	<10	<10	<10
Vinyl chloride	75-01-4	525	<10	<10	<10	<10	<10	<10	<10	<10

Note: NA = not available for this parameter

Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to dilution factor and may be exaggerated.

TABLE 3-5. Summary of Shallow Zone Monitoring Wells, 4th Quarter 1998

safety-kleen. SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater
Parameter Type : Field/General Chemistry Units : See Below

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Units	Well Location								
				MW-108	MW-109	MW-110	MW-112	MW-116	MW-117	MW-118	MW-119	MW-120
Alkalinity, Total		NA	ug/L as CaCO3	1800000	170000	560000	170000	260000	590000	810000	270000	280000
Carbon Dioxide		NA	mg/L	1600	120	896	481	1460	696	1440	499	600
Chloride	16887-00-6	NA	mg/L	<3200M	300	2000	1800	400	590	500	8800	8300
Cyanide, Free	57-12-5	1	ug/L	<10	<10	<10	10	<10	<10	<10	<10	<10
Cyanide, Total	57-12-5	1	ug/L	<10	<10	110	300	30	43	45	85	<10
Dissolved Oxygen (DO)		NA	mg/L	0.1	4.23	1.1	2.47	14.02	7.59*	13.66*	1.2	7.2
Iron (Ferrous)	15438-31-0	NA	mg/L	<25	15	34.7	48.4	41.5	0.15	31.1	16.2	3 02
Methane	74-82-8	NA	mg/L	17.5	5.64	9.52	1.94	6.73	15.7	6.28	1.25	3 29
Nitrogen, Nitrate	14797-55-8	NA	ug/L	<1000	<100	130	<100	<100	<100	<100	<100	340
Nitrogen, Nitrite	14797-65-0	NA	mg/L	<1M	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0 05
Nitrogen, Nitrite and Nitrate		NA	mg/L	<0.05	<0.05	0.13	<0.05	0.061	<0.05	<0 05	<0.05	0 34
Oxidation Reduction Potential		NA	mV	-394.5	-7.2	-79.7	-20.5	-78.1	-63.6	-34.8	-175.2	-235.1
pH		NA	SU	8.74	6.07	6.62	6.2	6.56	6.95	6.42	6.9	6 21
Specific Conductivity		NA	uS	8.9	1.3	7.7	7	2	3.2	3.4	26.8	24.7
Sulfate	14808-79-8	NA	ug/L	11000	3200	3800	220000	67000	<1000	32000	1100000	1000000
Temperature		NA	degree C	13.51	12.2	13.28	11.9	12.13	13.8	13.3	15.6	10.1
Turbidity		NA	NTU	191.3	1.9	59.7	7.7	8.3	1273+	24.2	29.6	1.4

Note: NA = not available for this parameter. * = DO sensor problems, readings may not be accurate. + = Turbidity sensor problems, readings may not be accurate.
Data Qualifiers: M = duplicate precision not met.

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safety-kleen

TABLE 3-5. Summary of Shallow Zone Monitoring Wells, 4th Quarter 1998

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater
Parameter Type : Field/General Chemistry Units : See Below

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Units	Well Location								
				MW-121	MW-122	MW-123	MW-124	MW-129	MW-130	P-24	P-25A	MW-105
Alkalinity, Total		NA	ug/L as CaCO3	60000	150000	260000	560000	380000	350000	780000	260000	230000
Carbon Dioxide		NA	mg/L	220	384	283	1060	668	650	994	310	348
Chloride	16887-00-6	NA	mg/L	1200	2200	2100	670	260	780	330	60	620
Cyanide, Free	57-12-5	1	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cyanide, Total	57-12-5	1	ug/L	<10	<10	200	28	51	57	150	17	19
Dissolved Oxygen (DO)		NA	mg/L	2.72	0.68	2.6	1.26	0.47	15.41*	1.26	3.55	4.21
Iron (Ferrous)	15438-31-0	NA	mg/L	34.4	42.5	35.8	<0.1	5.98	66.7	<0.5	1.32	9.56
Methane	74-82-8	NA	mg/L	0.147	0.279	0.68	15.7	7.4	8.4	9.5	0.545	1.56
Nitrogen, Nitrate	14797-55-8	NA	ug/L	<100	<100	<100	<100	<100	<100	<200	<100	<100
Nitrogen, Nitrite	14797-65-0	NA	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05M	<0.05	<0.05
Nitrogen, Nitrite and Nitrate		NA	mg/L	<0.05	0.085	<0.05	<0.05	<0.05	<0.05	0.077	<0.05	<0.05
Oxidation Reduction Potential		NA	mV	107.1	17.1	-35.1	-72.1	-62.3	-63.4	-310.3	-25.9	-37.6
pH		NA	SU	5.61	6.22	6.43	6.89	6.71	6.57	6.74	6.62	6.43
Specific Conductivity		NA	uS	4.3	8.2	8.5	5.8	1.7	3.7	2.8	0.824	2.8
Sulfate	14808-79-8	NA	ug/L	84000	560000	300000	69000	2100	2400	55000	57000	220000
Temperature		NA	degree C	13.7	12.2	12.57	14.01	15.3	13.6	8.5	13.5	14.7
Turbidity		NA	NTU	186.5	416+	220.5	386+	1251.4+	2.6	25.5	0	0

Note: NA = not available for this parameter. * = DO sensor problems, readings may not be accurate. + = Turbidity sensor problems, readings may not be accurate.
Data Qualifiers: M = duplicate precision not met.

TABLE 3-5. Summary of Shallow Zone Monitoring Wells, 4th Quarter 1998

Laboratory : SK (ENCOTEC) Matrix : Groundwater
Parameter Type : Metals, Total Units : ug/L

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location MW-108	MW-109	MW-110	MW-112	MW-116	MW-117	MW-118	MW-119	MW-120
Aluminum	7429-90-5	NA	3400	<200	460	<200	<200	<200	<200	330	<200
Antimony	7440-36-0	4300	<60	<60	<60	<60	<60	<60	<60	<60	<60
Arsenic	7440-38-2	0.136	<10	<10	15	14	<10	<10	11	46	33
Barium	7440-39-3	NA	<200	280	940	690	460	540	520	490	<200
Beryllium	7440-41-7	NA	<5	<5	<5	<5	<5	<5	<5	<5	<5
Cadmium	7440-43-9	NA	<5	<5	<5	8	6.6	<5	<5	<5	<5
Calcium	7440-70-2	NA	5400	64000	110000	120000	71000	120000	110000	80000	210000
Chromium	7440-47-3	3230	1900	<10	12	34	<10	<10	<10	<10	48
Cobalt	7440-48-4	NA	<50	<20	<50	<50	<50	<50	<50	<50	<50
Copper	7440-50-8	NA	<25	<25	32	46	35	<25	<25	<25	<25
Iron	7439-89-6	NA	270	27000	49000	71000	66000	21000	41000	800	2400
Lead	7439-92-1	NA	5.1	3.2	13	3.7	<3	<3	4	3.6	<3
Magnesium	7439-95-4	NA	16000	24000	120000	27000	35000	52000	54000	39000	550000
Manganese	7439-96-5	100	40	2800	740	2200	1300	450	3300	1000	380
Mercury	7439-97-6	0.146	0.35	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nickel	7440-02-0	3900	44	<40	<40	<40	<40	<40	<40	<40	<40
Potassium	7440-09-7	NA	35000	6000	63000	140000	11000	26000	20000	7000	170000
Selenium	7782-49-2	NA	<5	<5	<5	<5	<5	<5	<5	<5	<5
Silver	7440-22-4	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
Sodium	7440-23-5	NA	1500000	150000	1200000	1200000	240000	370000	470000	420000	4500000
Thallium	7440-28-0	6.22	<10	<10	<10	<10	<10	<10	<10	<10	<10
Vanadium	7440-62-2	NA	590	<50	<50	<50	<50	<50	<50	<50	<50
Zinc	7440-66-6	NA	61	22	49	<20	<20	<20	<20	31	<200M

Note: NA = not available for this parameter
Data Qualifiers: M = deplicate precision not met.

safety-kleen

TABLE 3-5. Summary of Shallow Zone Monitoring Wells, 4th Quarter 1998

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater
Parameter Type : Metals, Total Units : ug/L

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location								
			MW-121	MW-122	MW-123	MW-124	MW-129	MW-130	P-24	P-25A	MW-105
Aluminum	7429-90-5	**NA**	<200	<200	<200	<200	<200	<200	<200	<200	<200
Antimony	7440-36-0	**4300**	<60	<60	<60	<60	<60	<60	<60	<60	<60
Arsenic	7440-38-2	**0.136**	53	13	11	14	<10	<10	<10	<10	240
Barium	7440-39-3	**NA**	210	<200	290	<200	<200	760	<200	<200	<200
Beryllium	7440-41-7	**NA**	<5	<5	<5	<5	<5	<5	<5	<5	<5
Cadmium	7440-43-9	**NA**	<5	<5	<5	<5	<5	8.3	<5	<5	<5
Calcium	7440-70-2	**NA**	65000	110000	150000	110000	140000	95000	180000	68000	160000
Chromium	7440-47-3	**3230**	13	<10	24	<10	<10	<10	<10	<10	<10
Cobalt	7440-48-4	**NA**	<50	<50	<50	<50	<50	<50	<50	<50	<20
Copper	7440-50-8	**NA**	<25	31	32	<25	<25	54	<25	<25	<25
Iron	7439-89-6	**NA**	20000	51000	51000	13000	24000	85000	1000	3400	18000
Lead	7439-92-1	**NA**	16	6.3	4.4	<3	<3	<3	<3	<3	<3
Magnesium	7439-95-4	**NA**	79000	100000	130000	59000	27000	48000	60000	30000	42000
Manganese	7439-96-5	**100**	470	2700	1600	390	820	1100	260	670	450
Mercury	7439-97-6	**0.146**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.24	<0.2	<0.2
Nickel	7440-02-0	**3900**	<40	<40	<40	<40	<40	<40	<40	<40	<40
Potassium	7440-09-7	**NA**	29000	130000	76000	36000	17000	25000	16000	11000	28000
Selenium	7782-49-2	**NA**	<5	<5	<5	<5	<5	<5	<5	<5	<5
Silver	7440-22-4	**NA**	<10	<10	<10	<10	<10	<10	<10	<10	<10
Sodium	7440-23-5	**NA**	600000	1300000	1100000	420000	110000	440000	240000	39000	350000
Thallium	7440-28-0	**6.22**	<10	<10	<10	<10	<10	<10	<10	<10	<10
Vanadium	7440-62-2	**NA**	<50	<50	<50	<50	<50	<50	<20	<50	<50
Zinc	7440-66-6	**NA**	34	46	25	<20	<20	24	<20	<20	<20

Note: NA = not available for this parameter
Data Qualifiers: M = duplicate prescision not met.

safety-kleen

TABLE 3-5. Summary of Shallow Zone Monitoring Wells, 4th Quarter 1998

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater
Parameter Type : Organic, Semi-Volatile Units : ug/L

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location MW-108	MW-109	MW-110	MW-112	MW-116	MW-117	MW-118	MW-119	MW-120
1,2,4-Trichlorobenzene	120-82-1	113	<200	<10	<10	<10	<50	<10	<10	<200	<10
1,2-Dichlorobenzene	95-50-1	16500	<200	<10	<10	<10	<50	<10	<10	<200	<10
1,3-Dichlorobenzene	541-73-1	22200	<200	<10	<10	<10	<50	<10	<10	<200	<10
1,4-Dichlorobenzene	106-46-7	3159	400	20	<10	<10	<50	<10	<10	<200	<10
2,4,5-Trichlorophenol	95-95-4	9790	<500	<25	<25	<25	<120	<25	<25	<500	<25
2,4,6-Trichlorophenol	88-06-2	6.53	<200	<10	<10	<10	<50	<10	<10	<200	<10
2,4-Dichlorophenol	120-83-2	794	<200	<10	<10	<10	<50	<10	<10	<200	<10
2,4-Dimethylphenol	105-67-9	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
2,4-Dinitrophenol	51-28-5	14000	<500	<25	<25	<25	<120	<25	<25	<500	<25
2,4-Dinitrotoluene	121-14-2	9.1	<200	<10	<10	<10	<50	<10	<10	<200	<10
2,6-Dinitrotoluene	606-20-2	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
2-Chloronaphthalene	91-58-7	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
2-Chlorophenol	95-57-8	402	<200	<10	<10	<10	<50	<10	<10	<200	<10
2-Methylnaphthalene	91-57-6	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
2-Methylphenol	95-48-7	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
2-Nitroaniline	88-74-4	NA	<500	<25	<25	<25	<120	<25	<25	<500	<25
2-Nitrophenol	88-75-5	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
3,3'-Dichlorobenzidine	91-94-1	0.0767	<200	<10	<10	<10	<50	<10	<10	<200	<10
3-Nitroaniline	99-09-2	NA	<500	<25	<25	<25	<120	<25	<25	<500	<25
4,6-Dinitro-2-methylphenol	534-52-1	765	<500	<25	<25	<25	<120	<25	<25	<500	<25
4-Bromophenyl phenyl ether	101-55-3	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
4-Chloro-3-Methylphenol	59-50-7	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
4-Chloroaniline	106-47-8	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
4-Chlorophenyl phenyl ether	7005-72-3	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
4-Methylphenol	106-44-5	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
4-Nitroaniline	100-01-6	NA	<500	<25	<25	<25	<120	<25	<25	<500	<25
4-Nitrophenol	100-02-7	NA	<500	<25	<25	<25	<120	<25	<25	<500	<25
Acenaphthene	83-32-9	NA	<200	<10	24	<10	130	<10	11	<200	<10
Acenaphthylene	208-96-8	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
Anthracene	120-12-7	108000	<200	<10	<10	<10	<50	<10	<10	<200	<10
Benzo(a)Anthracene	56-55-3	0.031	<200	<10	<10	<10	<50	<10	<10	<200	<10
Benzo(a)Pyrene	50-32-8	0.031	<200	<10	<10	<10	<50	<10	<10	<200	<10
Benzo(b)Fluoranthene	205-99-2	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
Benzo(g,h,i)perylene	191-24-2	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
Benzo(k)Fluoranthene	207-08-9	0.031	<200	<10	<10	<10	<50	<10	<10	<200	<10

Note: NA = not available for this parameter
Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to dilution factor and may be exaggerated.

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location								
			MW-108	MW-109	MW-110	MW-112	MW-116	MW-117	MW-118	MW-119	MW-120
Bis(2-Chloroethoxy)Methane	111-91-1	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
Bis(2-Chloroethyl) Ether	111-44-4	1.4	<200	<10	<10	<10	<50	<10	<10	<200	<10
Bis(2-Chloroisopropyl) Ether	108-60-1	170000	<200	<10	<10	<10	<50	<10	<10	<200	<10
Bis(2-Ethylhexyl) Phthalate	117-81-7	5.92	<200	<10	<10	<10	<50	<10	<10	<200	<10
Butyl Benzyl Phthalate	85-68-7	416	<200	<10	<10	<10	<50	<10	<10	<200	<10
Carbazole	86-74-8	NA	<200	<10	<10	<10	470	<10	14	<200	<10
Chrysene	218-01-9	0.031	<200	<10	<10	<10	<50	<10	<10	<200	<10
Di-N-Butyl phthalate	84-74-2	15700	<200	<10	<10	<10	<50	<10	<10	<200	<10
Di-N-Octyl phthalate	117-84-0	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
Dibenz(a,h)anthracene	53-70-3	0.031	<200	<10	<10	<10	<50	<10	<10	<200	<10
Dibenzofuran	132-64-9	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
Diethyl phthalate	84-66-2	111000	<200	<10	<10	<10	<50	<10	<10	<200	<10
Dimethyl phthalate	131-11-3	2900000	<200	<10	<10	<10	<50	<10	<10	<200	<10
Fluoranthene	206-44-0	393	<200	<10	<10	<10	<50	<10	<10	<200	<10
Fluorene	86-73-7	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
Hexachlorobenzene	118-74-1	0.000775	<200	<10	<10	<10	<50	<10	<10	<200	<10
Hexachlorobutadiene	87-68-3	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
Hexachlorocyclopentadiene	77-47-4	17000	<200	<10	<10	<10	<50	<10	<10	<200	<10
Hexachloroethane	67-72-1	12.4	<200	<10	<10	<10	<50	<10	<10	<200	<10
Indeno(1,2,3-c,d)pyrene	193-39-5	0.031	<200	<10	<10	<10	<50	<10	<10	<200	<10
Isophorone	78-59-1	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
N-Nitroso-di-N-propylamine	621-64-7	NA	<200	<10	<10	<10	<50	<10	<10	<200	<10
N-Nitrosodiphenylamine	86-30-6	16.2	<200	<10	<10	<10	<50	<10	<10	<200	<10
Naphthalene	91-20-3	NA	1700	<10	<10	<10	<50	<10	<10	790	<10
Nitrobenzene	98-95-3	1900	<200	<10	<10	<10	<50	<10	<10	<200	<10
Pentachlorophenol	87-86-5	8.2	<500	<25	<25	<25	<120	<25	<25	<500	<25
Phenanthrene	85-01-8	NA	<200	<10	<10	<10	<50	<10	14	<200	10
Phenol	108-95-2	4600000	<200	<10	<10	<10	<50	<10	<10	<200	<10
Pyrene	129-00-0	8970	<200	<10	<10	<10	<50	<10	<10	<200	<10

Note: NA = not available for this parameter

Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to dilution factor and may be exaggerated.

safety-kleen

TABLE 3-5. Summary of Shallow Zone Monitoring Wells, 4th Quarter 1998

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater
Parameter Type : Volatile, Semi-volatile Units : ug/L

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location								
			MW-121	MW-122	MW-123	MW-124	MW-129	MW-130	P-24	P-25A	MW-102
1,2,4-Trichlorobenzene	120-82-1	113	<200	<10	<10	<1000	<10	<10	<100	<10	<10
1,2-Dichlorobenzene	95-50-1	16500	<200	<10	<10	<1000	<10	<10	<100	<10	<10
1,3-Dichlorobenzene	541-73-1	22200	<200	<10	<10	<1000	<10	<10	<100	<10	<10
1,4-Dichlorobenzene	106-46-7	3159	<200	<10	<10	<1000	<10	<10	<100	<10	<10
2,4,5-Trichlorophenol	95-95-4	9790	<500	<25	<25	<2500	<25	<25	<250	<25	<25
2,4,6-Trichlorophenol	88-06-2	6.53	<200	<10	<10	<1000	<10	<10	<100	<10	<10
2,4-Dichlorophenol	120-83-2	794	<200	<10	<10	<1000	<10	<10	<100	<10	<10
2,4-Dimethylphenol	105-67-9	NA	<200	<10	<10	2900	<10	<10	<100	<10	<10
2,4-Dinitrophenol	51-28-5	14000	<500	<25	<25	<2500	<25	<25	<250	<25	<25
2,4-Dinitrotoluene	121-14-2	9.1	<200	<10	<10	<1000	<10	<10	<100	<10	<10
2,6-Dinitrotoluene	606-20-2	NA	<200	<10	<10	<1000	<10	<10	<100	<10	<10
2-Chloronaphthalene	91-58-7	NA	<200	<10	<10	<1000	<10	<10	<100	<10	<10
2-Chlorophenol	95-57-8	402	<200	<10	<10	<1000	<10	<10	<100	<10	<10
2-Methylnaphthalene	91-57-6	NA	<200	<10	<10	<1000	<10	<10	<100	<10	<10
2-Methylphenol	95-48-7	NA	<200	<10	<10	1500	<10	<10	<100	<10	<10
2-Nitroaniline	88-74-4	NA	<500	<25	<25	<2500	<25	<25	<250	<25	<25
2-Nitrophenol	88-75-5	NA	<200	<10	<10	<1000	<10	<10	<100	<10	<10
3,3'-Dichlorobenzidine	91-94-1	0.0767	<200	<10	<10	<1000	<10	<10	<100	<10	<10
3-Nitroaniline	99-09-2	NA	<500	<25	<25	<2500	<25	<25	<250	<25	<25
4,6-Dinitro-2-methylphenol	534-52-1	765	<500	<25	<25	<2500	<25	<25	<250	<25	<25
4-Bromophenyl phenyl ether	101-55-3	NA	<200	<10	<10	<1000	<10	<10	<100	<10	<10
4-Chloro-3-Methylphenol	59-50-7	NA	<200	<10	<10	<1000	<10	<10	<100	<10	<10
4-Chloroaniline	106-47-8	NA	<200	<10	<10	<1000	<10	<10	<100	<10	<10
4-Chlorophenyl phenyl ether	7005-72-3	NA	<200	<10	<10	<1000	<10	<10	<100	<10	<10
4-Methylphenol	106-44-5	NA	<200	<10	<10	<1000	<10	<10	<100	<10	<10
4-Nitroaniline	100-01-6	NA	<500	<25	<25	<2500	<25	<25	<250	<25	<25
4-Nitrophenol	100-02-7	NA	<500	<25	<25	<2500	<25	<25	<250	<25	<25
Acenaphthene	83-32-9	NA	<200	<10	<10	<1000	<10	13	<100	<10	<10
Acenaphthylene	208-96-8	NA	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Anthracene	120-12-7	108000	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Benzo(a)Anthracene	56-55-3	0.031	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Benzo(a)Pyrene	50-32-8	0.031	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Benzo(b)Fluoranthene	205-99-2	NA	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Benzo(g,h,i)perylene	191-24-2	NA	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Benzo(k)Fluoranthene	207-08-9	0.031	<200	<10	<10	<1000	<10	<10	<100	<10	<10

Note: NA = not available for this parameter
Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to dilution factor and may be exaggerated.

03-11-1999

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location								
			MW-121	MW-122	MW-123	MW-124	MW-129	MW-130	P-24	P-25A	MW-102
Bis(2-Chloroethoxy)Methane	111-91-1	**NA**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Bis(2-Chloroethyl) Ether	111-44-4	**1.4**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Bis(2-Chloroisopropyl) Ether	108-60-1	**170000**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Bis(2-Ethylhexyl) Phthalate	117-81-7	**5.92**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Butyl Benzyl Phthalate	85-68-7	**416**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Carbazole	86-74-8	**NA**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Chrysene	218-01-9	**0.031**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Di-N-Butyl phthalate	84-74-2	**15700**	<200	11	<10	<1000	<10	<10	<100	<10	<10
Di-N-Octyl phthalate	117-84-0	**NA**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Dibenz(a,h)anthracene	53-70-3	**0.031**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Dibenzofuran	132-64-9	**NA**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Diethyl phthalate	84-66-2	**111000**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Dimethyl phthalate	131-11-3	**2900000**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Fluoranthene	206-44-0	**393**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Fluorene	86-73-7	**NA**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Hexachlorobenzene	118-74-1	**0.000775**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Hexachlorobutadiene	87-68-3	**NA**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Hexachlorocyclopentadiene	77-47-4	**17000**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Hexachloroethane	67-72-1	**12.4**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Indeno(1,2,3-c,d)pyrene	193-39-5	**0.031**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Isophorone	78-59-1	**NA**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
N-Nitroso-di-N-propylamine	621-64-7	**NA**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
N-Nitrosodiphenylamine	86-30-6	**16.2**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Naphthalene	91-20-3	**NA**	910	<10	<10	8100	<10	<10	910	<10	<10
Nitrobenzene	98-95-3	**1900**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Pentachlorophenol	87-86-5	**8.2**	<500	<25	<25	<2500	<25	<25	<250	<25	<25
Phenanthrene	85-01-8	**NA**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Phenol	108-95-2	**4600000**	<200	<10	<10	<1000	<10	<10	<100	<10	<10
Pyrene	129-00-0	**8970**	<200	<10	<10	<1000	<10	<10	<100	<10	<10

Note: NA = not available for this parameter

Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to dilution factor and may be exaggerated.

TABLE 3-5. Summary of Shallow Zone Monitoring Wells, 4th Quarter 1998 SK Services (East), L.C.

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Laboratory : SK (ENCOTEC)   Matrix : Groundwater
Parameter Type : Organic, Volatile   Units : ug/L

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location MW-108	MW-109	MW-110	MW-112	MW-116	MW-117	MW-118	MW-119	MW-120
1,1,1-Trichloroethane	71-55-6	NA	<10	<12	<10	<10	<10	<10	<10	<10	<10
1,1,2,2-Tetrachloroethane	79-34-5	NA	<10	<12	<10	<10	<10	<10	<10	<10	<10
1,1,2-Trichloroethane	79-00-5	NA	<10	<12	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethane	75-34-3	NA	<10	<12	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	75-35-4	NA	<10	<12	<10	<10	<10	<10	<10	<10	<10
1,2-Dichloroethane	107-06-2	99	<10	<12	<10	<10	<10	<10	<10	<10	<10
1,2-Dichloropropane	78-87-5	NA	<10	<12	<10	<10	<10	<10	<10	<10	<10
2-Butanone (MEK)	78-93-3	NA	<10	<25	<10	<10	<10	<10	<10	<10	<10
2-Hexanone	591-78-6	NA	<10	<25	<10	<10	<10	<10	<10	<10	<10
4-Methyl-2-Pentanone (MIBK)	108-10-1	NA	<10	<25	<10	<10	<10	<10	<10	<10	<10
Acetone	67-64-1	NA	<10	<25	<10	<10	<10	<10	14	<10	<10
Benzene	71-43-2	71	12	50	<10	<10	<10	<10	<10	<10	<10
Bromodichloromethane	75-27-4	22	<10	<12	<10	<10	<10	<10	<10	<10	<10
Bromoform	75-25-2	360	<10	<12	<10	<10	<10	<10	<10	<10	<10
Bromomethane	74-83-9	NA	<10	<12	<10	<10	<10	<10	<10	<10	<10
Carbon Disulfide	75-15-0	NA	<10	<12	<10	<10	<10	<10	<10	<10	<10
Carbon tetrachloride	56-23-5	6.31	<10	<12	<10	<10	<10	<10	<10	<10	<10
Chlorobenzene	108-90-7	21000	49	350	<10	<10	<10	<10	<10	<10	<10
Chloroethane	75-00-3	NA	<10	<12	<10	<10	<10	<10	<10	<10	<10
Chloroform	67-66-3	470	<10	<12	<10	<10	<10	<10	<10	<10	<10
Chloromethane	74-87-3	NA	<10	<12	<10	<10	<10	<10	<10	<10	<10
cis-1,3-Dichloropropene	10061-01-5	NA	<10	<12	<10	<10	<10	<10	<10	<10	<10
Dibromochloromethane	124-48-1	NA	<10	<12	<10	<10	<10	<10	<10	<10	<10
Ethylbenzene	100-41-4	27900	<10	<12	<10	<10	<10	<10	<10	<10	<10
Methylene chloride	75-09-2	1600	<10	13K	<10	<10	<10	<10	<10	<10	<10
Styrene	100-42-5	NA	<10	<12	<10	<10	<10	<10	<10	<10	<10
Tetrachloroethene	127-18-4	4.29	<10	<12	<10	<10	<10	<10	<10	<10	<10
Toluene	108-88-3	200000	<10	<12	<10	<10	<10	<10	<10	<10	<10
total 1,2-Dichloroethene	540-59-0	NA	<10	<12	<10	<10	<10	<10	<10	<10	<10
Total Xylenes	1330-20-7	NA	<10	<12	<10	<10	<10	<10	<10	<10	<10
trans-1,3-Dichloropropene	10061-02-6	NA	<10	<12	<10	<10	<10	<10	<10	<10	<10
Trichloroethene	79-01-6	81	<10	<12	<10	<10	<10	<10	<10	<10	<10
Vinyl chloride	75-01-4	525	<10	<12	<10	<10	<10	<10	<10	<10	<10

Note: NA = not available for this parameter
Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to dilution factor and may be exaggerated.

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TABLE 3-5. Summary of Shallow Zone Monitoring Wells, 4th Quarter 1998

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater

Parameter Type : Organic, Volatile Units : ug/L

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location								
			MW-121	MW-122	MW-123	MW-124	MW-129	MW-130	P-24	P-25A	MW-105
1,1,1-Trichloroethane	71-55-6	NA	<10	<10	<10	<100	<10	<10	<25	<10	<10
1,1,2,2-Tetrachloroethane	79-34-5	NA	<10	<10	<10	<100	<10	<10	<25	<10	<10
1,1,2-Trichloroethane	79-00-5	NA	<10	<10	<10	<100	<10	<10	<25	<10	<10
1,1-Dichloroethane	75-34-3	NA	<10	<10	<10	<100	<10	<10	<25	<10	<10
1,1-Dichloroethene	75-35-4	NA	<10	<10	<10	<100	<10	<10	<25	<10	<10
1,2-Dichloroethane	107-06-2	99	<10	<10	<10	<100	<10	<10	<25	<10	<10
1,2-Dichloropropane	78-87-5	NA	<10	<10	<10	<100	<10	<10	<25	<10	<10
2-Butanone (MEK)	78-93-3	NA	<10	<10	<10	<200	<10	<10	<50	<10	<10
2-Hexanone	591-78-6	NA	<10	<10	<10	<200	<10	<10	<50	<10	<10
4-Methyl-2-Pentanone (MIBK)	108-10-1	NA	<10	<10	<10	<200	<10	<10	<50	<10	<10
Acetone	67-64-1	NA	<10	<10	<10	430	<10	<10	<50	<10	<10
Benzene	71-43-2	71	<10	<10	<10	2900	<10	<10	940	<10	<10
Bromodichloromethane	75-27-4	22	<10	<10	<10	<100	<10	<10	<25	<10	<10
Bromoform	75-25-2	360	<10	<10	<10	<100	<10	<10	<25	<10	<10
Bromomethane	74-83-9	NA	<10	<10	<10	<100	<10	<10	<25	<10	<10
Carbon Disulfide	75-15-0	NA	<10	<10	<10	<100	<10	<10	<25	<10	<10
Carbon tetrachloride	56-23-5	6.31	<10	<10	<10	<100	<10	<10	<25	<10	<10
Chlorobenzene	108-90-7	21000	<10	<10	<10	<100	<10	<10	<25	<10	<10
Chloroethane	75-00-3	NA	<10	<10	<10	<100	<10	<10	<25	<10	<10
Chloroform	67-66-3	470	<10	<10	<10	<100	<10	<10	<25	<10	<10
Chloromethane	74-87-3	NA	<10	<10	<10	<100	<10	<10	<25	<10	<10
cis-1,3-Dichloropropene	10061-01-5	NA	<10	<10	<10	<100	<10	<10	<25	<10	<10
Dibromochloromethane	124-48-1	NA	<10	<10	<10	<100	<10	<10	<25	<10	<10
Ethylbenzene	100-41-4	27900	<10	<10	<10	280	<10	<10	160	<10	<10
Methylene chloride	75-09-2	1600	<10	<10	<10	<100	<10	<10	<25	<10	<10
Styrene	100-42-5	NA	<10	<10	<10	<100	<10	<10	<25	<10	<10
Tetrachloroethene	127-18-4	4.29	<10	<10	<10	<100	<10	<10	<25	<10	<10
Toluene	108-88-3	200000	<10	<10	<10	980	<10	<10	61	<10	<10
total 1,2-Dichloroethene	540-59-0	NA	<10	<10	<10	<100	<10	<10	<25	<10	<10
Total Xylenes	1330-20-7	NA	11	<10	<10	610	<10	<10	110	<10	<10
trans-1,3-Dichloropropene	10061-02-6	NA	<10	<10	<10	<100	<10	<10	<25	<10	<10
Trichloroethene	79-01-6	81	<10	<10	<10	<100	<10	<10	<25	<10	<10
Vinyl chloride	75-01-4	525	<10	<10	<10	<100	<10	<10	<25	<10	<10

Note: NA = not available for this parameter

Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to dilution factor and may be exaggerated.

SK Services (East), L.C.

Table 3-6. Comparison of Detected Parameters for Shallow Zone Compliance Well MW-103.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4
General Chemistry						
	Alkalinity, Total		NA			260,000.00
	Ammonia (as N)	7664-41-7	NA	100.00		
	Carbon Dioxide		NA			577,000.00
	Chloride	16887-00-6	NA	125,000.00	930,000.00	1,100,000.00
	Cyanide, Total	57-12-5	**1.0**	10.00		15.00
	Iron (Ferrous)	15438-31-0	NA	1,500.00		35,700.00
	Methane	74-82-8	NA	713.33		578.00
	Nitrogen, Nitrate	14797-55-8	NA	320.00		
	Solids, Total Dissolved		NA	340,000.00	1,900,000.00	
	Sulfate	14808-79-8	NA			220,000.00
Metals, Total						
	Aluminum	7429-90-5	NA	31,600.00	90.70	
	Antimony	7440-36-0	**4,300.0**	24.80		
	Arsenic	7440-38-2	**0.136**	63.20	7.15	
	Barium	7440-39-3	NA	665.00	453.00	270.00
	Beryllium	7440-41-7	NA	2.64	0.47	
	Cadmium	7440-43-9	NA		0.21	
	Calcium	7440-70-2	NA	38,600.00	98,800.00	130,000.00
	Chromium	7440-47-3	**3,230.0**	108.00	0.94	
	Cobalt	7440-48-4	NA	53.60	4.03	
	Copper	7440-50-8	NA	1,010.00		
	Iron	7439-89-6	NA	206,000.00	64,900.00	36,000.00
	Lead	7439-92-1	NA	1,400.00		
	Magnesium	7439-95-4	NA	24,700.00	46,600.00	55,000.00
	Manganese	7439-96-5	**100.0**	1,380.00	807.00	970.00
	Mercury	7439-97-6	**0.146**	0.99		
	Nickel	7440-02-0	**3,900.0**	125.00	2.76	
	Potassium	7440-09-7	NA	7,800.00	39,700.00	58,000.00
	Selenium	7782-49-2	NA	1.50		
	Silver	7440-22-4	NA	0.71		
	Sodium	7440-23-5	NA	28,600.00	420,000.00	640,000.00
	Thallium	7440-28-0	**6.22**	7.46		
	Vanadium	7440-62-2	NA	141.00		
	Zinc	7440-66-6	NA	781.00		
Organic, Semi-Volatile						
	2-Methylnaphthalene	91-57-6	NA	2.30		
	Acenaphthene	83-32-9	NA	4.40		
	Acenaphthylene	208-96-8	NA	0.61		
	Anthracene	120-12-7	**108,000.0**	1.60		
	Benzo(a)Anthracene	56-55-3	**0.031**	3.70		
	Benzo(a)Pyrene	50-32-8	**0.031**	2.60		
	Benzo(b)Fluoranthene	205-99-2	NA	5.40		
	Benzo(g,h,i)perylene	191-24-2	NA	3.00		
	Benzo(k)Fluoranthene	207-08-9	**0.031**	1.70		
	Bis(2-Ethylhexyl) Phthal	117-81-7	**5.92**	0.73		
	Carbazole	86-74-8	NA	0.58		
	Chrysene	218-01-9	**0.031**	3.90		

Note: NA = not available for this parameter

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4
	Dibenz(a,h)anthracene	53-70-3	**0.031**	0.84		
	Dibenzofuran	132-64-9	NA	2.10		
	Fluoranthene	206-44-0	**393.0**	6.20		
	Fluorene	86-73-7	NA	3.00		
	Indeno(1,2,3-c,d)pyrene	193-39-5	**0.031**	2.50		
	Naphthalene	91-20-3	NA	7.60		
	Phenanthrene	85-01-8	NA	9.40	1.30	
	Pyrene	129-00-0	**8,970.0**	5.40		
Organic, Volatile						
	Acetone	67-64-1	NA	8.50	11.00	
	Methylene chloride	75-09-2	**1,600.0**		2.00	

Note: NA = not available for this parameter

Table 3-6. Comparison of Detected Parameters for Shallow Zone Compliance Well MW-104.

Parameter Type	Parameter Name	CAS #.	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q4
General Chemistry					
	Alkalinity, Total		NA		210,000.00
	Ammonia (as N)	7664-41-7	NA	330.00	
	Carbon Dioxide		NA		172,000.00
	Chloride	16887-00-6	NA	47,000.00	62,000.00
	Cyanide, Total	57-12-5	**1.0**		14.00
	Iron (Ferrous)	15438-31-0	NA	390.00	540.00
	Methane	74-82-8	NA	832.34	1,510.00
	Solids, Total Dissolved		NA	340,000.00	
	Sulfate	14808-79-8	NA		170,000.00
Metals, Total					
	Antimony	7440-36-0	**4,300.0**	1.97	
	Calcium	7440-70-2	NA		120,000.00
	Chromium	7440-47-3	**3,230.0**	8.91	
	Cobalt	7440-48-4	NA	3.10	
	Iron	7439-89-6	NA	20,100.00	3,800.00
	Magnesium	7439-95-4	NA		21,000.00
	Manganese	7439-96-5	**100.0**		190.00
	Potassium	7440-09-7	NA		15,000.00
	Sodium	7440-23-5	NA		180,000.00
	Vanadium	7440-62-2	NA	11.90	
Organic, Semi-Volatile					
	2-Methylnaphthalene	91-57-6	NA	2.70	
	Acenaphthene	83-32-9	NA	5.50	12.00
	Acenaphthylene	208-96-8	NA	1.30	
	Anthracene	120-12-7	**108,000.0**	1.40	
	Benzo(a)Anthracene	56-55-3	**0.031**	2.80	
	Benzo(a)Pyrene	50-32-8	**0.031**	3.10	
	Benzo(b)Fluoranthene	205-99-2	NA	2.70	
	Benzo(g,h,i)perylene	191-24-2	NA	2.10	
	Benzo(k)Fluoranthene	207-08-9	**0.031**	0.66	
	Chrysene	218-01-9	**0.031**	2.30	
	Fluoranthene	206-44-0	**393.0**	3.40	
	Fluorene	86-73-7	NA	1.20	
	Indeno(1,2,3-c,d)pyrene	193-39-5	**0.031**	1.60	
	Phenanthrene	85-01-8	NA	3.70	
	Pyrene	129-00-0	**8,970.0**	6.20	
Organic, Volatile					
	Benzene	71-43-2	**71.0**	1.50	

Note: NA = not available for this parameter

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Table 3-6. Comparison of Detected Parameters for Shallow Zone Compliance Well MW-106.

SK Services (East), L.C.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q4
General Chemistry					
	Alkalinity, Total		NA		360,000.00
	Ammonia (as N)	7664-41-7	NA	9,900.00	
	Carbon Dioxide		NA		558,000.00
	Chloride	16887-00-6	NA	120,000.00	720,000.00
	Cyanide, Total	57-12-5	**1.0**	20.00	35.00
	Iron (Ferrous)	15438-31-0	NA	1,400.00	5,650.00
	Methane	74-82-8	NA	6,609.54	4,940.00
	Nitrogen, Nitrate	14797-55-8	NA	120.00	
	Solids, Total Dissolved		NA	520,000.00	
	Sulfate	14808-79-8	NA		260,000.00
Metals, Total					
	Aluminum	7429-90-5	NA	10,100.00	
	Antimony	7440-36-0	**4,300.0**	1.88	
	Arsenic	7440-38-2	**0.136**	27.00	
	Barium	7440-39-3	NA	69.70	
	Beryllium	7440-41-7	NA	0.73	
	Calcium	7440-70-2	NA	90,600.00	160,000.00
	Chromium	7440-47-3	**3,230.0**	23.10	
	Cobalt	7440-48-4	NA	8.43	
	Copper	7440-50-8	NA	48.80	
	Iron	7439-89-6	NA	29,000.00	9,700.00
	Lead	7439-92-1	NA	40.20	
	Magnesium	7439-95-4	NA	27,400.00	61,000.00
	Manganese	7439-96-5	**100.0**	351.00	340.00
	Mercury	7439-97-6	**0.146**	0.86	
	Nickel	7440-02-0	**3,900.0**	19.70	
	Potassium	7440-09-7	NA	10,700.00	41,000.00
	Selenium	7782-49-2	NA	1.62	
	Sodium	7440-23-5	NA	57,100.00	420,000.00
	Vanadium	7440-62-2	NA	36.00	
	Zinc	7440-66-6	NA	174.00	
Organic, Semi-Volatile					
	4-Methylphenol	106-44-5	NA	0.65	
	Bis(2-Ethylhexyl) Phthalat	117-81-7	**5.92**	1.30	
	Naphthalene	91-20-3	NA	1.30	
	Phenanthrene	85-01-8	NA	0.65	
Organic, Volatile					
	Methylene chloride	75-09-2	**1,600.0**		6.00
	Toluene	108-88-3	**200,000.0**		2.20
	Total Xylenes	1330-20-7	NA		1.80

Note: NA = not available for this parameter

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Table 3-6. Comparison of Detected Parameters for Shallow Zone Compliance Well P-19.

SK Services (East), L.C.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q4
General Chemistry					
	Alkalinity, Total		NA		310,000.00
	Ammonia (as N)	7664-41-7	NA	1,300.00	
	Carbon Dioxide		NA		367,000.00
	Chloride	16887-00-6	NA	10,000.00	96,000.00
	Cyanide, Total	57-12-5	**1.0**		11.00
	Iron (Ferrous)	15438-31-0	NA	6,700.00	6,430.00
	Methane	74-82-8	NA	703.56	1,480.00
	Nitrogen, Nitrate	14797-55-8	NA	280.00	110.00
	Nitrogen, Nitrite and Nitra		NA		110.00
	Solids, Total Dissolved		NA	430,000.00	
	Sulfate	14808-79-8	NA	52,000.00	110,000.00
Metals, Total					
	Aluminum	7429-90-5	NA	6,930.00	
	Antimony	7440-36-0	**4,300.0**	4.74	
	Arsenic	7440-38-2	**0.136**	53.00	
	Barium	7440-39-3	NA	110.00	
	Beryllium	7440-41-7	NA	0.80	
	Calcium	7440-70-2	NA	77,900.00	160,000.00
	Chromium	7440-47-3	**3,230.0**	26.60	
	Cobalt	7440-48-4	NA	21.40	
	Copper	7440-50-8	NA	290.00	
	Iron	7439-89-6	NA	124,000.00	21,000.00
	Lead	7439-92-1	NA	312.00	
	Magnesium	7439-95-4	NA	30,500.00	51,000.00
	Manganese	7439-96-5	**100.0**	411.00	540.00
	Mercury	7439-97-6	**0.146**	1.30	
	Nickel	7440-02-0	**3,900.0**	96.50	
	Potassium	7440-09-7	NA	7,700.00	15,000.00
	Sodium	7440-23-5	NA	39,000.00	230,000.00
	Thallium	7440-28-0	**6.22**	6.53	
	Vanadium	7440-62-2	NA	23.60	
	Zinc	7440-66-6	NA	846.00	370.00
Organic, Semi-Volatile					
	Anthracene	120-12-7	**108,000.0**	0.59	
	Benzo(a)Anthracene	56-55-3	**0.031**	3.20	
	Benzo(a)Pyrene	50-32-8	**0.031**	2.90	
	Benzo(b)Fluoranthene	205-99-2	NA	4.50	
	Benzo(g,h,i)perylene	191-24-2	NA	1.30	
	Benzo(k)Fluoranthene	207-08-9	**0.031**	1.30	
	Chrysene	218-01-9	**0.031**	3.20	
	Fluoranthene	206-44-0	**393.0**	4.00	
	Indeno(1,2,3-c,d)pyrene	193-39-5	**0.031**	1.30	
	Phenanthrene	85-01-8	NA	1.30	
	Pyrene	129-00-0	**8,970.0**	4.30	

Note: NA = not available for this parameter

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Table 3-6. Comparison of Detected Parameters for Shallow Zone Monitoring Well SWW-25.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q4
General Chemistry					
	Alkalinity, Total		NA		170,000.00
	Ammonia (as N)	7664-41-7	NA	3,800.00	
	Carbon Dioxide		NA		238,000.00
	Chloride	16887-00-6	NA	110,000.00	3,700,000.00
	Cyanide, Total	57-12-5	**1.0**	130.00	24.00
	Iron (Ferrous)	15438-31-0	NA		4,060.00
	Methane	74-82-8	NA	196.77	123.00
	Nitrogen, Nitrate	14797-55-8	NA	240.00	450.00
	Nitrogen, Nitrite and Nitra		NA		450.00
	Solids, Total Dissolved		NA	410,000.00	
	Sulfate	14808-79-8	NA		350,000.00
Metals, Total					
	Aluminum	7429-90-5	NA	15,700.00	
	Antimony	7440-36-0	**4,300.0**	10.80	
	Arsenic	7440-38-2	**0.136**	66.60	23.00
	Barium	7440-39-3	NA	385.00	
	Beryllium	7440-41-7	NA	1.13	
	Cadmium	7440-43-9	NA	0.13	
	Calcium	7440-70-2	NA	83,100.00	160,000.00
	Chromium	7440-47-3	**3,230.0**	46.30	11.00
	Cobalt	7440-48-4	NA	47.80	
	Copper	7440-50-8	NA	676.00	
	Iron	7439-89-6	NA	53,300.00	7,800.00
	Lead	7439-92-1	NA	344.00	
	Magnesium	7439-95-4	NA	33,500.00	36,000.00
	Manganese	7439-96-5	**100.0**	463.00	270.00
	Mercury	7439-97-6	**0.146**	0.96	
	Nickel	7440-02-0	**3,900.0**	186.00	130.00
	Potassium	7440-09-7	NA	9,440.00	39,000.00
	Selenium	7782-49-2	NA	19.30	
	Silver	7440-22-4	NA	0.41	
	Sodium	7440-23-5	NA	39,900.00	230,000.00
	Thallium	7440-28-0	**6.22**	5.66	
	Vanadium	7440-62-2	NA	73.10	
	Zinc	7440-66-6	NA	288.00	58.00
Organic, Semi-Volatile					
	Acenaphthene	83-32-9	NA	10.00	
	Benzo(a)Anthracene	56-55-3	**0.031**	1.50	
	Benzo(a)Pyrene	50-32-8	**0.031**	1.70	
	Benzo(b)Fluoranthene	205-99-2	NA	2.70	
	Benzo(g,h,i)perylene	191-24-2	NA	0.84	
	Benzo(k)Fluoranthene	207-08-9	**0.031**	0.73	
	Chrysene	218-01-9	**0.031**	1.40	
	Fluoranthene	206-44-0	**393.0**	1.80	
	Indeno(1,2,3-c,d)pyrene	193-39-5	**0.031**	0.85	
	Pyrene	129-00-0	**8,970.0**	1.70	
Organic, Volatile					
	Benzene	71-43-2	**71.0**	4.80	

Note: NA = not available for this parameter

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Table 3-6. Comparison of Detected Parameters for Shallow Zone Monitoring Well MW-105.

SK Services (East), L.C.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q4
General Chemistry					
	Alkalinity, Total		NA		230,000.00
	Ammonia (as N)	7664-41-7	NA	2,600.00	
	Carbon Dioxide		NA		348,000.00
	Chloride	16887-00-6	NA	70,000.00	620,000.00
	Cyanide, Total	57-12-5	**1.0**	40.00	19.00
	Iron (Ferrous)	15438-31-0	NA	670.00	9,560.00
	Methane	74-82-8	NA	1,601.21	1,560.00
	Nitrogen, Nitrate	14797-55-8	NA	120.00	
	Solids, Total Dissolved		NA	1,200,000.00	
	Sulfate	14808-79-8	NA	520,000.00	220,000.00
Metals, Total					
	Aluminum	7429-90-5	NA	2,420.00	
	Antimony	7440-36-0	**4,300.0**	2.58	
	Arsenic	7440-38-2	**0.136**	675.00	240.00
	Barium	7440-39-3	NA	94.40	
	Beryllium	7440-41-7	NA	0.26	
	Calcium	7440-70-2	NA	118,000.00	160,000.00
	Chromium	7440-47-3	**3,230.0**	16.10	
	Cobalt	7440-48-4	NA	2.95	
	Copper	7440-50-8	NA	74.00	
	Iron	7439-89-6	NA	31,300.00	18,000.00
	Lead	7439-92-1	NA	77.80	
	Magnesium	7439-95-4	NA	36,400.00	42,000.00
	Manganese	7439-96-5	**100.0**	352.00	450.00
	Nickel	7440-02-0	**3,900.0**	10.70	
	Potassium	7440-09-7	NA	10,000.00	28,000.00
	Selenium	7782-49-2	NA	1.94	
	Sodium	7440-23-5	NA	99,800.00	350,000.00
	Thallium	7440-28-0	**6.22**	2.34	
	Vanadium	7440-62-2	NA	15.50	
	Zinc	7440-66-6	NA	40.40	
Organic, Semi-Volatile					
	2-Methylnaphthalene	91-57-6	NA	1.80	
	Fluorene	86-73-7	NA	0.67	
Organic, Volatile					
	Benzene	71-43-2	**71.0**	14.00	
	total 1,2-Dichloroethene	540-59-0	NA	4.70	

Note: NA = not available for this parameter

Table 3-6. Comparison of Detected Parameters for Shallow Zone Monitoring Well MW-108.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q4
General Chemistry					
	Alkalinity, Total		NA		1,800,000.00
	Ammonia (as N)	7664-41-7	NA	23,000.00	
	Carbon Dioxide		NA		1,600,000.00
	Chloride	16887-00-6	NA	1,900,000.00	
	Iron (Ferrous)	15438-31-0	NA	14,000.00	
	Methane	74-82-8	NA	16,557.91	17,500.00
	Solids, Total Dissolved		NA	5,300,000.00	
	Sulfate	14808-79-8	NA		11,000.00
Metals, Total					
	Aluminum	7429-90-5	NA	12,800.00	3,400.00
	Antimony	7440-36-0	**4,300.0**	50.00	
	Barium	7440-39-3	NA	209.00	
	Beryllium	7440-41-7	NA	1.08	
	Cadmium	7440-43-9	NA	1.02	
	Calcium	7440-70-2	NA	27,400.00	5,400.00
	Chromium	7440-47-3	**3,230.0**	34,400.00	1,900.00
	Cobalt	7440-48-4	NA	21.40	
	Copper	7440-50-8	NA	138.00	
	Iron	7439-89-6	NA	21,600.00	270.00
	Lead	7439-92-1	NA	284.00	5.10
	Magnesium	7439-95-4	NA	30,600.00	16,000.00
	Manganese	7439-96-5	**100.0**	434.00	40.00
	Mercury	7439-97-6	**0.146**	1.90	0.35
	Nickel	7440-02-0	**3,900.0**	124.00	44.00
	Potassium	7440-09-7	NA	54,100.00	35,000.00
	Selenium	7782-49-2	NA	4.81	
	Silver	7440-22-4	NA	0.50	
	Sodium	7440-23-5	NA	1,467,000.00	1,500,000.00
	Thallium	7440-28-0	**6.22**	16.10	
	Vanadium	7440-62-2	NA	930.00	590.00
	Zinc	7440-66-6	NA	666.00	61.00
Organic, Semi-Volatile					
	1,4-Dichlorobenzene	106-46-7	**3,159.0**	180.00	400.00
	2,4-Dichlorophenol	120-83-2	**794.0**	2.30	
	2,4-Dimethylphenol	105-67-9	NA	84.00	
	2-Methylphenol	95-48-7	NA	38.00	
	4-Methylphenol	106-44-5	NA	35.00	
	Acenaphthene	83-32-9	NA	6.80	
	Naphthalene	91-20-3	NA	770.00	1,700.00
	Phenol	108-95-2	**4,600,000.0**	19.00	
Organic, Volatile					
	Benzene	71-43-2	**71.0**	170.00	12.00
	Chlorobenzene	108-90-7	**21,000.0**	320.00	49.00
	Toluene	108-88-3	**200,000.0**	14.00	
	Total Xylenes	1330-20-7	NA	24.00	

Note: NA = not available for this parameter

Table 3-6. Comparison of Detected Parameters for Shallow Zone Monitoring Well MW-109.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q4
General Chemistry					
	Alkalinity, Total		NA		170,000.00
	Ammonia (as N)	7664-41-7	NA	1,500.00	
	Carbon Dioxide		NA		120,000.00
	Chloride	16887-00-6	NA	410,000.00	300,000.00
	Iron (Ferrous)	15438-31-0	NA		15,000.00
	Methane	74-82-8	NA	1,228.51	5,640.00
	Nitrogen, Nitrate	14797-55-8	NA	110.00	
	Solids, Total Dissolved		NA	810,000.00	
	Sulfate	14808-79-8	NA		3,200.00
Metals, Total					
	Aluminum	7429-90-5	NA	5,680.00	
	Arsenic	7440-38-2	**0.136**	2.29	
	Barium	7440-39-3	NA	139.00	280.00
	Beryllium	7440-41-7	NA	0.44	
	Calcium	7440-70-2	NA	30,400.00	64,000.00
	Chromium	7440-47-3	**3,230.0**	16.30	
	Cobalt	7440-48-4	NA	4.61	
	Copper	7440-50-8	NA	21.40	
	Iron	7439-89-6	NA	18,300.00	27,000.00
	Lead	7439-92-1	NA	6.19	3.20
	Magnesium	7439-95-4	NA	17,400.00	24,000.00
	Manganese	7439-96-5	**100.0**	1,170.00	2,800.00
	Nickel	7440-02-0	**3,900.0**	10.40	
	Potassium	7440-09-7	NA	8,150.00	6,000.00
	Sodium	7440-23-5	NA	137,000.00	150,000.00
	Vanadium	7440-62-2	NA	9.27	
	Zinc	7440-66-6	NA	37.30	22.00
Organic, Semi-Volatile					
	1,2-Dichlorobenzene	95-50-1	**16,500.0**	9.20	
	1,3-Dichlorobenzene	541-73-1	**22,200.0**	9.10	
	1,4-Dichlorobenzene	106-46-7	**3,159.0**	25.00	20.00
	Bis(2-Ethylhexyl) Phthalat	117-81-7	**5.92**	1.70	
Organic, Volatile					
	Benzene	71-43-2	**71.0**	2.30	50.00
	Chlorobenzene	108-90-7	**21,000.0**	170.00	350.00
	Methylene chloride	75-09-2	**1,600.0**		13.00

Note: NA = not available for this parameter

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Table 3-6. Comparison of Detected Parameters for Shallow Zone Monitoring Well MW-110.

SK Services (East), L.C.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4
General Chemistry						
	Alkalinity, Total		NA		-	560,000.00
	Carbon Dioxide		NA			896,000.00
	Chloride	16887-00-6	NA	1,100,000.00	1,660,000.00	2,000,000.00
	Cyanide, Free	57-12-5	**1.0**	10.00		
	Cyanide, Total	57-12-5	**1.0**	150.00		110.00
	Iron (Ferrous)	15438-31-0	NA			34,700.00
	Methane	74-82-8	NA			9,520.00
	Nitrogen, Nitrate	14797-55-8	NA			130.00
	Nitrogen, Nitrite and Nit		NA			130.00
	Solids, Total Dissolved		NA	2,300,000.00	2,900,000.00	
	Sulfate	14808-79-8	NA			3,800.00
Metals, Total						
	Aluminum	7429-90-5	NA	1,050.00	31.70	460.00
	Arsenic	7440-38-2	**0.136**	10.20	4.35	15.00
	Barium	7440-39-3	NA	530.00	941.00	940.00
	Beryllium	7440-41-7	NA		0.55	
	Cadmium	7440-43-9	NA		0.32	
	Calcium	7440-70-2	NA	84,800.00	92,900.00	110,000.00
	Chromium	7440-47-3	**3,230.0**	15.00	1.86	12.00
	Cobalt	7440-48-4	NA	1.91	0.25	
	Copper	7440-50-8	NA	14.40		32.00
	Iron	7439-89-6	NA	24,000.00	25,600.00	49,000.00
	Lead	7439-92-1	NA	18.80		13.00
	Magnesium	7439-95-4	NA	84,100.00	90,000.00	120,000.00
	Manganese	7439-96-5	**100.0**	628.00	563.00	740.00
	Mercury	7439-97-6	**0.146**	2.37		
	Nickel	7440-02-0	**3,900.0**	8.99	1.50	
	Potassium	7440-09-7	NA	46,400.00	92,300.00	63,000.00
	Selenium	7782-49-2	NA	2.40		
	Sodium	7440-23-5	NA	635,000.00	885,000.00	1,200,000.00
	Thallium	7440-28-0	**6.22**	4.43		
	Vanadium	7440-62-2	NA	15.50		
	Zinc	7440-66-6	NA	67.10		49.00
Organic, Semi-Volatile						
	2-Methylnaphthalene	91-57-6	NA	1.40		
	Acenaphthene	83-32-9	NA		25.00	24.00
	Acenaphthylene	208-96-8	NA	2.60	2.20	
	Anthracene	120-12-7	**108,000.0**	1.00		
	Carbazole	86-74-8	NA	7.50		
	Dibenzofuran	132-64-9	NA	2.90	1.30	
	Fluorene	86-73-7	NA	4.00		
	Naphthalene	91-20-3	NA	1.30		
	Phenanthrene	85-01-8	NA	2.20		
	Pyrene	129-00-0	**8,970.0**	0.62		
Organic, Volatile						
	Acetone	67-64-1	NA	3.30	12.00	
	Benzene	71-43-2	**71.0**		6.90	
	Methylene chloride	75-09-2	**1,600.0**		2.00	

Note: NA = not available for this parameter

Table 3-6. Comparison of Detected Parameters for Shallow Zone Monitoring Well MW-112.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4
General Chemistry						
	Alkalinity, Total		NA			170,000.00
	Carbon Dioxide		NA			481,000.00
	Chloride	16887-00-6	NA	46,000.00	1,560,000.00	1,800,000.00
	Cyanide, Free	57-12-5	**1.0**			10.00
	Cyanide, Total	57-12-5	**1.0**	510.00	220.00	300.00
	Iron (Ferrous)	15438-31-0	NA			48,400.00
	Methane	74-82-8	NA			1,940.00
	Solids, Total Dissolved		NA	340,000.00	2,600,000.00	
	Sulfate	14808-79-8	NA			220,000.00
Metals, Total						
	Aluminum	7429-90-5	NA	2,960.00	71.00	
	Arsenic	7440-38-2	**0.136**	20.50	3.64	14.00
	Barium	7440-39-3	NA	248.00	692.00	690.00
	Beryllium	7440-41-7	NA		0.93	
	Cadmium	7440-43-9	NA		0.25	8.00
	Calcium	7440-70-2	NA	23,100.00	62,400.00	120,000.00
	Chromium	7440-47-3	**3,230.0**	10.50	1.10	34.00
	Cobalt	7440-48-4	NA	6.81	4.80	
	Copper	7440-50-8	NA	14.40		46.00
	Iron	7439-89-6	NA	23,600.00	29,000.00	71,000.00
	Lead	7439-92-1	NA	20.10		3.70
	Magnesium	7439-95-4	NA	9,050.00	18,600.00	27,000.00
	Manganese	7439-96-5	**100.0**	411.00	734.00	2,200.00
	Mercury	7439-97-6	**0.146**	2.98		
	Nickel	7440-02-0	**3,900.0**	7.23	2.20	
	Potassium	7440-09-7	NA	11,100.00	101,000.00	140,000.00
	Sodium	7440-23-5	NA	46,200.00	833,000.00	1,200,000.00
	Vanadium	7440-62-2	NA	11.60		
	Zinc	7440-66-6	NA	25.30		
Organic, Semi-Volatile						
	Acenaphthene	83-32-9	NA	0.70	5.20	
	Benzo(b)Fluoranthene	205-99-2	NA	0.62		
	Butyl Benzyl Phthalate	85-68-7	**416.0**		3.00	
	Fluorene	86-73-7	NA		1.60	
	Pyrene	129-00-0	**8,970.0**	0.56		
Organic, Volatile						
	Acetone	67-64-1	NA	5.40	10.00	

Note: NA = not available for this parameter

Table 3-6. Comparison of Detected Parameters for Shallow Zone Monitoring Well P-24.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q4
General Chemistry					
	Alkalinity, Total		NA		780,000.00
	Ammonia (as N)	7664-41-7	NA	19,000.00	
	Carbon Dioxide		NA		994,000.00
	Chloride	16887-00-6	NA	150,000.00	330,000.00
	Cyanide, Total	57-12-5	1.0	3,800.00	150.00
	Iron (Ferrous)	15438-31-0	NA	4,970.00	
	Methane	74-82-8	NA	6,075.33	9,500.00
	Nitrogen, Nitrite and Nitra		NA		77.00
	Solids, Total Dissolved		NA	1,200,000.00	
	Sulfate	14808-79-8	NA	32,000.00	55,000.00
Metals, Total					
	Aluminum	7429-90-5	NA	6,420.00	
	Antimony	7440-36-0	**4,300.0**	7.91	
	Arsenic	7440-38-2	**0.136**	24.30	
	Barium	7440-39-3	NA	61.00	
	Beryllium	7440-41-7	NA	0.50	
	Cadmium	7440-43-9	NA	0.52	
	Calcium	7440-70-2	NA	153,000.00	180,000.00
	Chromium	7440-47-3	**3,230.0**	62.50	
	Cobalt	7440-48-4	NA	8.72	
	Copper	7440-50-8	NA	669.00	
	Iron	7439-89-6	NA	48,900.00	1,000.00
	Lead	7439-92-1	NA	178.00	
	Magnesium	7439-95-4	NA	62,500.00	60,000.00
	Manganese	7439-96-5	**100.0**	809.00	260.00
	Mercury	7439-97-6	**0.146**	2.07	0.24
	Nickel	7440-02-0	**3,900.0**	46.70	
	Potassium	7440-09-7	NA	13,600.00	16,000.00
	Selenium	7782-49-2	NA	8.65	
	Silver	7440-22-4	NA	0.47	
	Sodium	7440-23-5	NA	181,000.00	240,000.00
	Thallium	7440-28-0	**6.22**	3.27	
	Vanadium	7440-62-2	NA	28.50	
	Zinc	7440-66-6	NA	310.00	
Organic, Semi-Volatile					
	2,4-Dimethylphenol	105-67-9	NA	2.90	
	2-Methylnaphthalene	91-57-6	NA	160.00	
	Acenaphthene	83-32-9	NA	56.00	
	Acenaphthylene	208-96-8	NA	20.00	
	Anthracene	120-12-7	**108,000.0**	4.60	
	Benzo(a)Anthracene	56-55-3	**0.031**	2.90	
	Benzo(a)Pyrene	50-32-8	**0.031**	1.60	
	Benzo(b)Fluoranthene	205-99-2	NA	2.50	
	Benzo(g,h,i)perylene	191-24-2	NA	0.78	
	Benzo(k)Fluoranthene	207-08-9	**0.031**	0.73	
	Bis(2-Ethylhexyl) Phthalat	117-81-7	**5.92**	0.66	
	Carbazole	86-74-8	NA	6.10	

Note: NA = not available for this parameter

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q4
	Chrysene	218-01-9	**0.031**	2.70	
	Dibenzofuran	132-64-9	**NA**	40.00	
	Fluoranthene	206-44-0	**393.0**	7.80	
	Fluorene	86-73-7	**NA**	19.00	
	Indeno(1,2,3-c,d)pyrene	193-39-5	**0.031**	0.79	
	Naphthalene	91-20-3	**NA**	240.00	910.00
	Phenanthrene	85-01-8	**NA**	15.00	
	Pyrene	129-00-0	**8,970.0**	7.40	
Organic, Volatile					
	Benzene	71-43-2	**71.0**	480.00	940.00
	Carbon Disulfide	75-15-0	**NA**	85.00	25.00
	Ethylbenzene	100-41-4	**27,900.0**	150.00	160.00
	Methylene chloride	75-09-2	**1,600.0**	2.70	
	Toluene	108-88-3	**200,000.0**	20.00	61.00
	Total Xylenes	1330-20-7	**NA**	71.00	110.00

Note: NA = not available for this parameter

TABLE 3-7
DEEP ZONE GROUNDWATER ELEVATION DATA
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Date:			8/6/98		8/20/98		9/1/98		9/18/98		10/1/98		10/14/98	
Well ID	TOC Elev. (ft-msl)	Ref.	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)
Deep Wells														
C-3	16.81	2	10.79	6.02	11.20	5.61	11.19	5.62	11.09	5.72	10.52	6.29	10.64	6.17
SWW-6.5	8.38	2	6.49	4.05	4.28	4.10	4.44	3.94	2.99	5.39	2.28	6.10	2.30	6.08
SWW-7.5	9.03	2	8.21	2.89	6.12	2.91	8.27	0.76	6.42	2.61	9.49	-0.46	8.96	0.07
SWW-9	9.37	2	5.62	3.75	4.40	4.97	4.25	5.12	4.25	5.12	5.00	4.37	4.52	4.85
W-13R	6.68	2	1.36	5.32	2.53	4.15	2.29	4.39	1.43	5.25	1.08	5.60	1.72	4.96
W-17	6.61	2	2.94	3.67	5.45	1.16	4.68	1.93	2.58	4.03	4.02	2.59	4.11	2.50
W-25	9.85	2	5.40	4.45	5.25	4.60	5.32	4.53	6.11	3.74	6.15	3.70	5.65	4.20
W-29	12.01	2	8.28	3.73	8.12	3.89	7.91	4.10	8.40	3.61	8.43	3.58	7.98	4.03
W-30R	9.48	2	NI	NI	NI	NI	5.68	3.80	5.83	3.65	5.68	3.80	5.47	4.01
W-31	7.72	2	4.86	2.86	5.73	1.99	5.49	2.23	9.55	3.17*	10.21	2.51*	10.20	2.52*

NOTES:
1) Surveyed by Casey & Keller, 1997
2) Surveyed by Casey & Keller, 1998
3) TOC = top of casing
4) ft-toc = feet below top of casing
5) ft-msl = feet above mean sea level
6) NI = well was not installed on measurement date
7) * = approximate values - wells were refurbished; survey data forthcoming
8) Approximate reference value for W-31 is 12.72 ft-msl, beginning with the 9/18/98 measurement. Survey data forthcoming.
9) Monitoring wells SWW-6.5, SWW-7.5, and SWW-9 were refurbished before 8/20/98 gauging event
10) Reference elevations for groundwater quality monitoring wells were raised by 0.06 feet after November 24, due to the installation of sampling pumps

TABLE 3-7
DEEP ZONE GROUNDWATER ELEVATION DATA
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Date:			10/28/98		11/9/98		11/24/98		12/8/98		12/22/98	
Well ID	TOC Elev. (ft-msl)	Ref.	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation (ft-msl)
Deep Wells												
C-3	16.81	2	10.82	5.99	10.47	6.34	10.52	6.29	10.53	6.28	10.52	6.29
SWW-6.5	8.38	2	2.21	6.17	2.17	6.21	1.25	7.13	2.63	5.75	3.10	5.28
SWW-7.5	9.03	2	8.56	0.47	6.83	2.20	8.80	0.23	6.22	2.81	9.24	-0.21
SWW-9	9.37	2	3.96	5.41	4.17	5.20	5.03	4.34	NM	NM	4.09	5.28
W-13R	6.68	2	1.32	5.36	1.08	5.60	2.30	4.44	1.71	5.03	2.23	4.51
W-17	6.61	2	3.00	3.61	3.87	2.74	4.52	2.15	2.79	3.88	2.76	3.91
W-25	9.85	2	4.90	4.95	4.91	4.94	6.27	3.64	6.51	3.40	5.38	4.53
W-29	12.01	2	8.06	3.95	8.27	3.74	8.96	3.11	8.66	3.41	8.06	4.01
W-30R	9.48	2	5.67	3.81	5.85	3.63	6.04	3.50	5.79	3.75	5.75	3.79
W-31	7.72	2	9.70	3.02*	10.13	2.59*	10.57	2.21*	9.57	3.21*	9.40	3.38*

NOTES: 1) Surveyed by Casey & Keller, 1997
2) Surveyed by Casey & Keller, 1998
3) TOC = top of casing
4) ft-toc = feet below top of casing
5) ft-msl = feet above mean sea level
6) NI = well was not installed on measurement date
7) * = approximate values - wells were refurbished; survey data forthcoming
8) Approximate reference value for W-31 is 12.72 ft-msl, beginning with the 9/18/98 measurement. Survey data forthcoming.
9) Monitoring wells SWW-6.5, SWW-7.5, and SWW-9 were refurbished before 8/20/98 gauging event
10) Reference elevations for groundwater quality monitoring wells were raised by 0.06 feet after November 24, due to the installation of sampling pumps

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TABLE 3-8. Summary of Deep Zone Monitoring Wells, 4th Quarter 1998

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater

Parameter Type : Field/General Chemistry Units : See Below

Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	Units	Well Location C-3	W-13R	W-17	W-25	W-29	W-30R	W-31
Chloride	16887-00-6	250000	mg/L	1800	780	1100	5100	2400	550	800
Cyanide, Free	57-12-5	NA	ug/L	<10	<10	<10	<10	<10	<10	<10
Cyanide, Total	57-12-5	200	ug/L	<10	15	<10	<10	10	<10	<10
Dissolved Oxygen (DO)		NA	mg/L	0.76	6.74	4.83	1.7	9.17*	1.6	8.82
Oxidation Reduction Potential		NA	mV	-2.6	-24.6	86.3	-108	-66	51.1	139.1
pH		NA	SU	7.03	11.34	7.03	6.81	7.07	7.11	7.01
Solids, Total Dissolved		500000	mg/L	2900	1400	1900	7000	3700	920	1500
Specific Conductivity		NA	uS	5.6	3.9	3.6	14.8	8	1.5	2.8
Temperature		NA	degree C	10.9	12.4	13.45	12.1	14.4	13.97	13.2
Turbidity		NA	NTU	1742.1	191.3	3.8	1556.3	200.5	59.6	28.2

Note: NA = not available for this parameter. * = DO sensor problems, readings may not be accurate. + = Turbidity sensor problems, readings may not be accurate.

Data Qualifiers: M = duplicate presicision not met.

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TABLE 3-8. Summary of Deep Zone Monitoring Wells, 4th Quarter 1998

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater
Parameter Type : Metals, Total Units : ug/L

Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	Well Location C-3	W-13R	W-17	W-25	W-29	W-30R	W-31
Aluminum	7429-90-5	NA	680	<200	<200	62000	2200	710	540
Antimony	7440-36-0	20	<60	<60	<60	<60	<60	<60	<60
Arsenic	7440-38-2	8	19	<10	<10	16	11	<10	<10
Barium	7440-39-3	2000	3200	770	310	1600	2000	240	520
Beryllium	7440-41-7	20	<5	<5	<5	<5	<5	<5	<5
Cadmium	7440-43-9	4	<5	<5	<5	17	<5	<5	<5
Calcium	7440-70-2	NA	270000	190000	250000	2500000	340000	160000	83000
Chromium	7440-47-3	100	<10	<10	<10	<10	<10	<10	<10
Cobalt	7440-48-4	NA	<50	<50	<50	66	<50	<20	<50
Copper	7440-50-8	1000	<25	<25	<25	200	<25	<25	<25
Iron	7439-89-6	300	17000	<100	350	130000	6900	1100	1000
Lead	7439-92-1	10	<3	17	4.7	<3	3.1	<3	<3
Magnesium	7439-95-4	NA	360000	<5000	72000	150000	130000	17000	40000
Manganese	7439-96-5	50			880				
Mercury	7439-97-6	2	<0.2	<0.2	<0.2	<0.2	<0.2	<0 2	<0.2
Nickel	7440-02-0	100	<40	<40	<40	110	<40	<40	<40
Potassium	7440-09-7	NA	38000	120000	8400	16000	20000	<5000	7500
Selenium	7782-49-2	50	<5	<5	<5	<5	<5	<5	<5
Silver	7440-22-4	NA	<10	<10	<10	<10	<10	<10	<10
Sodium	7440-23-5	50000	2700000	340000	380000	1200000	940000	180000	440000
Thallium	7440-28-0	10	<10	<10	<10	<10	<10	<10	<10
Vanadium	7440-62-2	NA	<50	<50	<50	180	<50	<50	<50
Zinc	7440-66-6	5000	<20	<20	<20	270	<20	<20	<20

Note: NA = not available for this parameter
Data Qualifiers: M = duplicate precision not met.

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TABLE 3-8. Summary of Deep Zone Monitoring Wells, 4th Quarter 1998

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater
Parameter Type : Organic, Semi-Volatile Units : ug/L

Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	Well Location C-3	W-13R	W-17	W-25	W-29	W-30R	W-31
1,2,4-Trichlorobenzene	120-82-1	9	<10	<10	<20	<10	<10	<10	<10
1,2-Dichlorobenzene	95-50-1	600	<10	<10	<20	<10	<10	<10	<10
1,3-Dichlorobenzene	541-73-1	600	<10	<10	<20	<10	<10	<10	<10
1,4-Dichlorobenzene	106-46-7	75	<10	<10	<20	<10	<10	<10	<10
2,4,5-Trichlorophenol	95-95-4	700	<25	<25	<50	<25	<25	<25	<25
2,4,6-Trichlorophenol	88-06-2	20	<10	<10	<20	<10	<10	<10	<10
2,4-Dichlorophenol	120-83-2	20	<10	<10	<20	<10	<10	<10	<10
2,4-Dimethylphenol	105-67-9	100	<10	<10	<20	<10	<10	<10	<10
2,4-Dinitrophenol	51-28-5	40	<25	<25	<50	<25	<25	<25	<25
2,4-Dinitrotoluene	121-14-2	10	<10	<10	<20	<10	<10	<10	<10
2,6-Dinitrotoluene	606-20-2	NA	<10	<10	<20	<10	<10	<10	<10
2-Chloronaphthalene	91-58-7	NA	<10	<10	<20	<10	<10	<10	<10
2-Chlorophenol	95-57-8	40	<10	<10	<20	<10	<10	<10	<10
2-Methylnaphthalene	91-57-6	100	<10	<10	<20	<10	<10	<10	<10
2-Methylphenol	95-48-7	NA	<10	<10	<20	<10	<10	<10	<10
2-Nitroaniline	88-74-4	NA	<25	<25	<50	<25	<25	<25	<25
2-Nitrophenol	88-75-5	NA	<10	<10	<20	<10	<10	<10	<10
3,3'-Dichlorobenzidine	91-94-1	NA	<10	<10	<20	<10	<10	<10	<10
3-Nitroaniline	99-09-2	NA	<25	<25	<50	<25	<25	<25	<25
4,6-Dinitro-2-methylphenol	534-52-1	NA	<25	<25	<50	<25	<25	<25	<25
4-Bromophenyl phenyl ether	101-55-3	NA	<10	<10	<20	<10	<10	<10	<10
4-Chloro-3-Methylphenol	59-50-7	NA	<10	<10	<20	<10	<10	<10	<10
4-Chloroaniline	106-47-8	NA	<10	<10	<20	<10	<10	<10	<10
4-Chlorophenyl phenyl ether	7005-72-3	NA	<10	<10	<20	<10	<10	<10	<10
4-Methylphenol	106-44-5	NA	<10	<10	<20	<10	<10	<10	<10
4-Nitroaniline	100-01-6	NA	<25	<25	<50	<25	<25	<25	<25
4-Nitrophenol	100-02-7	NA	<25	<25	<50	<25	<25	<25	<25
Acenaphthene	83-32-9	400	<10	<10	<20	<10	28	<10	<10
Acenaphthylene	208-96-8	NA	<10	<10	<20	<10	<10	<10	<10
Anthracene	120-12-7	2000	<10	<10	<20	<10	<10	<10	<10
Benzo(a)Anthracene	56-55-3	NA	<10	<10	<20	<10	<10	<10	<10
Benzo(a)Pyrene	50-32-8	NA	<10	<10	<20	<10	<10	<10	<10
Benzo(b)Fluoranthene	205-99-2	NA	<10	<10	<20	<10	<10	<10	<10
Benzo(g,h,i)perylene	191-24-2	NA	<10	<10	<20	<10	<10	<10	<10
Benzo(k)Fluoranthene	207-08-9	NA	<10	<10	<20	<10	<10	<10	<10

Note: NA = not available for this parameter
Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportionalto dilution factor and may be exaggerated

Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	Well Location						
			C-3	W-13R	W-17	W-25	W-29	W-30R	W-31
Bis(2-Chloroethoxy)Methane	111-91-1	NA	<10	<10	<20	<10	<10	<10	<10
Bis(2-Chloroethyl) Ether	111-44-4	NA	<10	<10	<20	<10	<10	<10	<10
Bis(2-Chloroisopropyl) Ether	108-60-1	NA	<10	<10	<20	<10	<10	<10	<10
Bis(2-Ethylhexyl) Phthalate	117-81-7	30	<10	<10	<20	<10	<10	<10	<10
Butyl Benzyl Phthalate	85-68-7	100	<10	<10	<20	<10	<10	<10	<10
Carbazole	86-74-8	100	<10	<10	<20	<10	10	<10	<10
Chrysene	218-01-9	NA	<10	<10	<20	<10	<10	<10	<10
Di-N-Butyl phthalate	84-74-2	NA	<10	<10	<20	<10	<10	<10	<10
Di-N-Octyl phthalate	117-84-0	NA	<10	<10	<20	<10	<10	<10	<10
Dibenz(a,h)anthracene	53-70-3	NA	<10	<10	<20	<10	<10	<10	<10
Dibenzofuran	132-64-9	100	<10	<10	<20	<10	16	<10	<10
Diethyl phthalate	84-66-2	NA	<10	<10	<20	<10	<10	<10	<10
Dimethyl phthalate	131-11-3	NA	<10	<10	<20	<10	<10	<10	<10
Fluoranthene	206-44-0	300	<10	<10	<20	<10	<10	<10	<10
Fluorene	86-73-7	300	<10	<10	<20	<10	17	<10	<10
Hexachlorobenzene	118-74-1	10	<10	<10	<20	<10	<10	<10	<10
Hexachlorobutadiene	87-68-3	1	<10	<10	<20	<10	<10	<10	<10
Hexachlorocyclopentadiene	77-47-4	50	<10	<10	<20	<10	<10	<10	<10
Hexachloroethane	67-72-1	10	<10	<10	<20	<10	<10	<10	<10
Indeno(1,2,3-c,d)pyrene	193-39-5	NA	<10	<10	<20	<10	<10	<10	<10
Isophorone	78-59-1	100	<10	<10	<20	<10	<10	<10	<10
N-Nitroso-di-N-propylamine	621-64-7	NA	<10	<10	<20	<10	<10	<10	<10
N-Nitrosodiphenylamine	86-30-6	20	<10	<10	<20	<10	<10	<10	<10
Naphthalene	91-20-3	100	<10	10	<20	<10	27	<10	<10
Nitrobenzene	98-95-3	10	<10	<10	<20	<10	<10	<10	<10
Pentachlorophenol	87-86-5	1	<25	<25	<50	<25	<25	<25	<25
Phenanthrene	85-01-8	NA	<10	<10	<20	<10	<10	<10	<10
Phenol	108-95-2	4000	<10	21	<20	<10	<10	<10	<10
Pyrene	129-00-0	200	<10	<10	<20	<10	<10	<10	<10

Note: NA = not available for this parameter

Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportionalto dilution factor and may be exaggerated.

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TABLE 3-8. Summary of Deep Zone Monitoring Wells, 4th Quarter 1998

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater

Parameter Type : Organic, Volatile Units : ug/L

Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	Well Location C-3	W-13R	W-17	W-25	W-29	W-30R	W-31
1,1,1-Trichloroethane	71-55-6	30	<10	<10	<10	<10	<10	<10	<10
1,1,2,2-Tetrachloroethane	79-34-5	2	<10	<10	<10	<10	<10	<10	<10
1,1,2-Trichloroethane	79-00-5	3	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethane	75-34-3	70	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	75-35-4	NA	<10	<10	<10	<10	<10	<10	<10
1,2-Dichloroethane	107-06-2	2	<10	<10	<10	<10	<10	<10	<10
1,2-Dichloropropane	78-87-5	1	<10	<10	<10	<10	<10	<10	<10
2-Butanone (MEK)	78-93-3	NA	<10	<10	<10	<10	<10	<10	<10
2-Hexanone	591-78-6	NA	<10	<10	<10	<10	<10	<10	<10
4-Methyl-2-Pentanone (MIBK)	108-10-1	NA	<10	<10	<10	<10	<10	<10	<10
Acetone	67-64-1	700	<10	<10	<10	<10	<10	<10	<10
Benzene	71-43-2	1	<10	<10	<10	<10	<10	<10	<10
Bromodichloromethane	75-27-4	1	<10	<10	<10	<10	<10	<10	<10
Bromoform	75-25-2	4	<10	<10	<10	<10	<10	<10	<10
Bromomethane	74-83-9	10	<10	<10	<10	<10	<10	<10	<10
Carbon Disulfide	75-15-0	NA	<10	<10	<10	<10	<10	<10	<10
Carbon tetrachloride	56-23-5	2	<10	<10	<10	<10	<10	<10	<10
Chlorobenzene	108-90-7	4	<10	<10	<10	<10	<10	<10	<10
Chloroethane	75-00-3	NA	<10	<10	<10	<10	<10	<10	<10
Chloroform	67-66-3	6	<10	<10	<10	<10	<10	<10	<10
Chloromethane	74-87-3	30	<10	<10	<10	<10	<10	<10	<10
cis-1,3-Dichloropropene	10061-01-5	NA	<10	<10	<10	<10	<10	<10	<10
Dibromochloromethane	124-48-1	10	<10	<10	<10	<10	<10	<10	<10
Ethylbenzene	100-41-4	700	<10	<10	<10	<10	<10	<10	<10
Methylene chloride	75-09-2	2	<10	<10	<10	<10	<10	<10	<10
Styrene	100-42-5	100	<10	<10	<10	<10	<10	<10	<10
Tetrachloroethene	127-18-4	1	<10	<10	<10	<10	<10	<10	<10
Toluene	108-88-3	1000	<10	<10	<10	<10	<10	<10	<10
total 1,2-Dichloroethene	540-59-0	NA	<10	<10	<10	<10	<10	<10	<10
Total Xylenes	1330-20-7	NA	<10	<10	<10	<10	<10	<10	<10
trans-1,3-Dichloropropene	10061-02-6	NA	<10	<10	<10	<10	<10	<10	<10
Trichloroethene	79-01-6	1	<10	<10	<10	<10	<10	<10	<10
Vinyl chloride	75-01-4	5	<10	<10	<10	<10	<10	<10	<10

Note: NA = not available for this parameter

Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to diolution factor and may be exaggerated..

Table 3-9. Comparison of Detected Parameters for Deep Zone Monitoring Well W-13R.

Parameter Type	Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	1998Q1	1998Q4
General Chemistry					
	Chloride	16887-00-6	250,000	670,000.00	780,000.00
	Cyanide, Total	57-12-5	200		15.00
	Solids, Total Dissolved		500,000	1,400,000.00	1,400,000.00
Metals, Total					
	Aluminum	7429-90-5	NA	1,650.00	
	Arsenic	7440-38-2	8	2.33	
	Barium	7440-39-3	2,000	512.00	770.00
	Beryllium	7440-41-7	20	0.32	
	Calcium	7440-70-2	NA	181,000.00	190,000.00
	Chromium	7440-47-3	100	15.60	
	Cobalt	7440-48-4	NA	1.93	
	Copper	7440-50-8	1,000	3.43	
	Iron	7439-89-6	300	2,120.00	
	Lead	7439-92-1	10	1.61	17.00
	Magnesium	7439-95-4	NA	24,800.00	
	Manganese	7439-96-5	50	334.00	
	Nickel	7440-02-0	100	11.20	
	Potassium	7440-09-7	NA	13,500.00	120,000.00
	Sodium	7440-23-5	50,000	165,000.00	340,000.00
	Vanadium	7440-62-2	NA	6.52	
	Zinc	7440-66-6	5,000	8.69	
Organic, Semi-Volatile					
	2-Methylnaphthalene	91-57-6	100	1.50	
	Acenaphthene	83-32-9	400	2.30	
	Bis(2-Ethylhexyl) Phthalat	117-81-7	30	0.83	
	Di-N-Butyl phthalate	84-74-2	NA	3.70	
	Dibenzofuran	132-64-9	100	0.57	
	Fluorene	86-73-7	300	0.90	
	Naphthalene	91-20-3	100	15.00	10.00
	Phenanthrene	85-01-8	NA	0.66	
	Phenol	108-95-2	4,000		21.00
Organic, Volatile					
	Methylene chloride	75-09-2	2	3.00	

Note: NA = not available for this parameter

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Table 3-9. Comparison of Detected Parameters for Deep Zone Monitoring Well W-17.

SK Services (East) L.C.

Parameter Type	Parameter Name	CAS #	NJ Class II-2 GWQC (ug/L)	1997Q2	1998Q4
General Chemistry					
	Chloride	16887-00-6	**250,000**	1,100,000.00	1,100,000.00
	Solids, Total Dissolved		**500,000**	2,800,000.00	1,900,000.00
Metals, Total					
	Aluminum	7429-90-5	**NA**	41,500.00	
	Arsenic	7440-38-2	**8**	40.00	
	Barium	7440-39-3	**2,000**	1,660.00	310.00
	Beryllium	7440-41-7	**20**	3.61	
	Cadmium	7440-43-9	**4**	5.36	
	Calcium	7440-70-2	**NA**	1,732,000.00	250,000.00
	Chromium	7440-47-3	**100**	297.00	
	Cobalt	7440-48-4	**NA**	50.30	
	Copper	7440-50-8	**1,000**	154.00	
	Iron	7439-89-6	**300**	69,500.00	350.00
	Lead	7439-92-1	**10**	105.00	4.70
	Magnesium	7439-95-4	**NA**	268,000.00	72,000.00
	Manganese	7439-96-5	**50**	20,300.00	880.00
	Mercury	7439-97-6	**2**	0.93	
	Nickel	7440-02-0	**100**	257.00	
	Potassium	7440-09-7	**NA**	23,500.00	8,400.00
	Selenium	7782-49-2	**50**	24.40	
	Sodium	7440-23-5	**50,000**	355,000.00	380,000.00
	Vanadium	7440-62-2	**NA**	80.80	
	Zinc	7440-66-6	**5,000**	241.00	

Note: NA = not available for this parameter

Table 3-9. Comparison of Detected Parameters for Deep Zone Monitoring Well W-25.

Parameter Type	Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	1997Q2	1998Q4
General Chemistry					
	Chloride	16887-00-6	**250,000**	2,700,000.00	5,100,000.00
	Solids, Total Dissolved		**500,000**	6,000,000.00	7,000,000.00
Metals, Total					
	Aluminum	7429-90-5	NA	4,050.00	62,000.00
	Arsenic	7440-38-2	**8**	5.11	16.00
	Barium	7440-39-3	**2,000**	7,140.00	1,600.00
	Beryllium	7440-41-7	**20**	0.55	
	Cadmium	7440-43-9	**4**	0.37	17.00
	Calcium	7440-70-2	NA	414,000.00	2,500,000.00
	Chromium	7440-47-3	**100**	22.40	
	Cobalt	7440-48-4	NA		66.00
	Copper	7440-50-8	**1,000**	9.65	200.00
	Iron	7439-89-6	**300**	8,260.00	130,000.00
	Lead	7439-92-1	**10**	3.32	
	Magnesium	7439-95-4	NA	130,000.00	150,000.00
	Manganese	7439-96-5	**50**	2,560.00	
	Nickel	7440-02-0	**100**	22.60	110.00
	Potassium	7440-09-7	NA	23,800.00	16,000.00
	Selenium	7782-49-2	**50**	4.16	
	Sodium	7440-23-5	**50,000**	1,032,000.00	1,200,000.00
	Thallium	7440-28-0	**10**	2.78	
	Vanadium	7440-62-2	NA	8.95	180.00
	Zinc	7440-66-6	**5,000**	26.10	270.00
Organic, Semi-Volatile					
	Acenaphthene	83-32-9	**400**	2.00	

Note: NA = not available for this parameter

Table 3-9. Comparison of Detected Parameters for Deep Zone Monitoring Well W-29.

Parameter Type	Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	1997Q2	1998Q4
General Chemistry					
	Chloride	16887-00-6	**250,000**	1,700,000.00	2,400,000.00
	Cyanide, Total	57-12-5	**200**		10.00
	Solids, Total Dissolved		**500,000**	4,600,000.00	3,700,000.00
Metals, Total					
	Aluminum	7429-90-5	**NA**	41,500.00	2,200.00
	Antimony	7440-36-0	**20**	0.82	
	Arsenic	7440-38-2	**8**	24.70	11.00
	Barium	7440-39-3	**2,000**	1,840.00	2,000.00
	Beryllium	7440-41-7	**20**	3.48	
	Cadmium	7440-43-9	**4**	2.78	
	Calcium	7440-70-2	**NA**	510,000.00	340,000.00
	Chromium	7440-47-3	**100**	83.00	
	Cobalt	7440-48-4	**NA**	42.60	
	Copper	7440-50-8	**1,000**	97.50	
	Iron	7439-89-6	**300**	63,800.00	6,900.00
	Lead	7439-92-1	**10**	52.10	3.10
	Magnesium	7439-95-4	**NA**	108,000.00	130,000.00
	Manganese	7439-96-5	**50**	4,720.00	
	Nickel	7440-02-0	**100**	103.00	
	Potassium	7440-09-7	**NA**	24,000.00	20,000.00
	Selenium	7782-49-2	**50**	5.17	
	Sodium	7440-23-5	**50,000**	561,000.00	940,000.00
	Thallium	7440-28-0	**10**	3.86	
	Vanadium	7440-62-2	**NA**	92.70	
	Zinc	7440-66-6	**5,000**	219.00	
Organic, Semi-Volatile					
	2-Methylnaphthalene	91-57-6	**100**	3.20	
	Acenaphthene	83-32-9	**400**	29.00	28.00
	Anthracene	120-12-7	**2,000**	4.70	
	Benzo(a)Anthracene	56-55-3	**NA**	1.20	
	Benzo(k)Fluoranthene	207-08-9	**NA**	1.00	
	Carbazole	86-74-8	**100**		10.00
	Dibenzofuran	132-64-9	**100**	18.00	16.00
	Fluoranthene	206-44-0	**300**	7.70	
	Fluorene	86-73-7	**300**	19.00	17.00
	Naphthalene	91-20-3	**100**		27.00
	Phenanthrene	85-01-8	**NA**	2.50	
	Pyrene	129-00-0	**200**	5.90	
Organic, Volatile					
	Total Xylenes	1330-20-7	**NA**	2.40	

Note: NA = not available for this parameter

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Table 3-9. Comparison of Detected Parameters for Deep Zone Monitoring Well W-31.

SK Services (East), L.C.

Parameter Type	Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	1997Q2	1998Q4
General Chemistry					
	Chloride	16887-00-6	**250,000**	850,000.00	800,000.00
	Solids, Total Dissolved		**500,000**	2,000,000.00	1,500,000.00
Metals, Total					
	Aluminum	7429-90-5	NA	5,370.00	540.00
	Arsenic	7440-38-2	**8**	2.44	
	Barium	7440-39-3	**2,000**	691.00	520.00
	Beryllium	7440-41-7	**20**	0.35	
	Cadmium	7440-43-9	**4**	0.24	
	Calcium	7440-70-2	NA	112,000.00	83,000.00
	Chromium	7440-47-3	**100**	6.42	
	Cobalt	7440-48-4	NA	6.44	
	Copper	7440-50-8	**1,000**	21.30	
	Iron	7439-89-6	**300**	9,100.00	1,000.00
	Lead	7439-92-1	**10**	5.72	
	Magnesium	7439-95-4	NA	54,800.00	40,000.00
	Manganese	7439-96-5	**50**	1,670.00	
	Nickel	7440-02-0	**100**	11.70	
	Potassium	7440-09-7	NA	12,600.00	7,500.00
	Selenium	7782-49-2	**50**	3.36	
	Sodium	7440-23-5	**50,000**	511,000.00	440,000.00
	Thallium	7440-28-0	**10**	3.72	
	Vanadium	7440-62-2	NA	12.20	
	Zinc	7440-66-6	**5,000**	53.00	
Organic, Semi-Volatile					
	Bis(2-Ethylhexyl) Phthalat	117-81-7	**30**	2.40	
	Butyl Benzyl Phthalate	85-68-7	**100**	1.60	

Note: NA = not available for this parameter

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Table 3-10 Summary of Field Duplicate Results

Parameter Name	MW-124	DUP	RPD	P-19	DUP	RPD
2,4-Dimethylphenol	2900	3100	6.7%			
2-Methylphenol	1500	1400	6.9%			
Acetone	<200	430	73.0%			
Alkalinity, Total	560000	550000	1.8%	290000	310000	6.7%
Arsenic	14	13	7.4%			
Benzene	2400	2900	18.9%			
Calcium	110000	120000	8.7%	160000	150000	6.5%
Carbon Dioxide	1060	625	51.6%	367	421	13.7%
Chloride	670	620	7.8%	610	96	145.6%
Cyanide, Free	<10	21	71.0%			
Cyanide, Total	28	31	10.2%	<10	11	9.5%
Ethylbenzene	240	280	15.4%			
Iron	13000	13000	0.0%	21000	20000	4.9%
Iron (Ferrous)				6.43	7.29	12.5%
Magnesium	59000	59000	0.0%	51000	48000	6.1%
Manganese	390	390	0.0%	540	510	5.7%
Methane	15.7	13.4	15.8%	1.48	1.62	9.0%
Naphthalene	8100	6600	20.4%			
Nitrogen, Nitrate				110	<100	9.5%
Nitrogen, Nitrite and Nitrate				0.11	<0.050	75.0%
Potassium	36000	37000	2.7%	15000	14000	6.9%
Sodium	420000	420000	0.0%	230000	210000	9.1%
Sulfate	69000	37000	60.4%	120000	110000	8.7%
Toluene	850	980	14.2%			
Total Xylenes	520	610	15.9%			
Zinc				370	350	5.6%

TABLE 5-1
IRM SYSTEM DOWN-TIME SUMMARY
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Down-Time Episode	Condition	Down-Time Start Date	Down-Time Stop Date	Down-Time (days)	Cumulative Down-Time (days)
1	Power outage	May 29, 1998	June 1, 1998	3	3
2	Power outage	June 17, 1998	June 22, 1998	5	8
3	Power outage	August 1, 1998	August 3, 1998	2	10
4	Power outage	August 11, 1998	August 12, 1998	1	11
5	Air line	August 12, 1998	August 13, 1998	1	12
6	IRM system modifications	August 24, 1998	September 2, 1998	9	21
7	Power outage	September 7, 1998	September 9, 1998	2	23
8	IRM conveyance line repair	September 12, 1998	September 22, 1998	10	33
9	IRM conveyance line repair	October 2, 1998	October 2, 1998	0.25	33.25
10	Power outage	October 5, 1998	October 5, 1998	0.25	33.5
11	Slurry wall construction	November 17, 1998	November 18, 1998	1	34.5
12	Electrical Repair	December 1, 1998	December 2, 1998	0.5	35
13	Piping Repair	December 2, 1998	December 3, 1998	0.75	35.75
14	Power outage	December 28, 1998	December 28, 1998	0.25	36
15	Power outage	December 30, 1998	December 30, 1998	0.25	36.25

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Quarterly Groundwater Monitoring
First Quarter 1999

Former Koppers Seaboard Site
Kearny, New Jersey

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EXECUTIVE SUMMARY

This Report has been prepared for submittal to the New Jersey Department of Environmental Protection (NJDEP) to document the results of performance monitoring activities related to the groundwater monitoring program at the former Koppers Seaboard Site (Site) in Kearny, New Jersey. The groundwater monitoring program has three components:

- a natural attenuation performance monitoring plan for Shallow-Zone groundwater;
- a Deep-Zone monitoring plan for Deep-Zone groundwater; and,
- a dense, non-aqueous phase liquid (DNAPL) monitoring plan.

The scope of the groundwater monitoring activities are described in detail in the NJDEP-approved Site Sampling and Analysis Plan (SAP, Key Environmental, June 1998).

The natural attenuation monitoring plan specifies that regulatory standards for Compliance Wells in the Shallow-Zone are New Jersey Class SE-2 Surface Water Quality Criteria (SE-2 SWQC). Because site related Constituents of Interest (COI) as well as background constituents have been detected at levels above the New Jersey Class II-A Groundwater Quality Criteria (II-A GWQC) a Classification Exception Area will be designated for the entire site in accordance with N.J.A.C.7.9-6.6.

The results of the first quarter 1999 groundwater monitoring event were relatively consistent with previous monitoring results at the Site. In general, the concentration and number of organic COI decreased across the site. No Site-related organic constituents were detected above applicable standards in either the Shallow-Zone Compliance Wells (SE-2 SWQC) or the Deep-Zone Wells (II-A GWQC). In addition, general water chemistry and natural indicator parameters are summarized to evaluate the effectiveness of the natural attenuation groundwater remedy.

Exceedances were noted for some inorganic parameters (mostly metals), however, concentrations of these parameters are distributed Site-wide, may be reflective of background and/or brackish groundwater conditions, and are not necessarily related to previous Site activities. For these reasons, re-sampling activities as specified in the April 1998 Remedial Action Work Plan (RAWP) and SAP were not scheduled. The NJDEP was notified of these exceedances (via verbal communication) per RAWP and SAP requirements. Standard sample collection and analyses will proceed at the site as specified in the SAP.

1. INTRODUCTION

1.1. MONITORING REQUIREMENTS / REGULATORY BACKGROUND

This Report has been prepared for submittal to the New Jersey Department of Environmental Protection (NJDEP) to document the results of performance monitoring activities related to the groundwater monitoring program at the former Koppers Seaboard Site (Site) in Kearny, New Jersey. As described in the NJDEP conditionally-approved Remedial Action Work Plan (RAWP)[1], the groundwater monitoring program has three components:

- a natural attenuation performance monitoring plan for Shallow-Zone groundwater;
- a Deep-Zone monitoring plan for Deep-Zone groundwater; and,
- a dense, non-aqueous phase liquid (DNAPL) monitoring plan.

The scope of the groundwater monitoring activities are described in detail in the NJDEP-approved Site Sampling and Analysis Plan (SAP)[2].

The natural attenuation monitoring plan specifies that regulatory standards for Compliance Wells in the Shallow-Zone are New Jersey Class SE-2 Surface Water Quality Criteria (SE-2 SWQC). Because site related Constituents of Interest (COI) as well as background constituents have been detected at levels above the New Jersey Class II-A Groundwater Quality Criteria (II-A GWQC) a Classification Exception Area will be designated for the entire site in accordance with N.J.A.C.7.9-6.6. Regulatory standards for Deep-Zone groundwater are II-A GWQC. Comparisons will be made between groundwater analytical data from Compliance Wells and SE-2 SWQC for Site-related COIs, which include organic constituents derived from coal tar chemicals, and mobile (i.e., free) cyanide.

Comparisons will also be made between analytical data from Compliance Wells and SE-2 SWQC for background constituents (i.e., metals); and evaluations will be made regarding the time trend of concentrations of background constituents (i.e., metals). General water chemistry and natural attenuation indicator parameters will also be summarized to evaluate the effectiveness of the natural attenuation groundwater remedy. This Report is organized as follows: Section 2.0 describes the monitoring methods; Section 3.0 describes results of the monitoring program; and Section 4.0 summarizes the results and presents recommendations and a schedule for future monitoring activities. Section 5.0 contains a summary of other site activities associated with the RWAP.

1.2. ACTIVITIES

The focus of this report is to document and summarize results from the groundwater monitoring activities at the Site during the first quarter of 1999. Sampling was conducted between March 24 and 31, 1999. Before sampling began, both a water level and DNAPL survey were conducted as part of the RAWP. The groundwater monitoring and low flow purging and sampling activities were observed at the site by NJDEP (Mr. George Nicholas) on Thursday, March 25, 1999.

2. METHODS

This section describes the activities and methods used for the Shallow and Deep-Zone groundwater monitoring plans as well as implementation of the natural attenuation performance monitoring plan and DNAPL monitoring plan, previously described in the RAWP. Activities were completed in accordance with the SAP.

Existing monitoring well functions and monitoring programs conducted during the first quarter 1999 are listed in Table 2-1. The locations of all Site monitoring wells are shown on Figure 2-1.

2.1. GROUNDWATER LEVEL MEASUREMENTS

Depths to groundwater measurements in Shallow-Zone monitoring wells were gauged over the entire Site (Figure 2-1) according to the bi-weekly schedule proposed in the RAWP and SAP. Water level measurements were obtained from the Shallow-Zone monitoring wells specified in the RAWP and SAP, plus additional well MW-130.

Deep-Zone water levels were gauged on a bi-weekly basis, in conjunction with the Shallow-Zone water level monitoring. Depth to water measurements were gauged in Deep-Zone monitoring wells (Figure 2-1) at a frequency greater than the quarterly monitoring proposed in the RAWP and SAP.

In accordance with the SAP, measurements were made using a Solinst Model 101 Water Level Meter or Solinst Model 122/P1 Interface Meter, depending on whether the well was also included in the DNAPL Monitoring Plan. The meter/probe was decontaminated as specified in the SAP between wells.

2.2. DNAPL THICKNESS MEASUREMENTS

DNAPL thickness measurements were gauged in several shallow and Deep-Zone Site monitoring wells (Figure 2-1) to evaluate whether DNAPL migration was occurring. DNAPL thickness measurements were obtained from wells specified in the RAWP and SAP, plus additional well MW-130.

In accordance with the SAP, measurements were made using a Solinst Model 122/P1 Interface Meter. Depth to DNAPL and total well depth were gauged to calculate the DNAPL thickness in wells where

DNAPL was observed; for wells in which DNAPL presence was not observed, the total well depth was gauged to verify that DNAPL was not present. The meter/probe was decontaminated as specified in the SAP between wells.

2.3. GROUNDWATER SAMPLING AND ANALYSIS

Groundwater sampling was conducted from all Shallow and Deep-Zone wells as specified in the RAWP and SAP (Figure 2-1), with a few exceptions (Table 2.1).

Groundwater sampling was performed using the dedicated Timco bladder pump system, with Teflon tubing. The pumps were set at approximately the midpoint of the screened interval. Wells were purged and sampled using low-flow techniques, as recommended by U.S. EPA Region II[3] and NJDEP to obtain samples most representative of groundwater. Water was purged from each well at a rate of approximately 100 - 200 mL/min prior to sampling. Depth to water in the well was gauged continuously during purging to insure that the water level was not being drawn down, as recommended by U.S. EPA.

During groundwater purging, field parameters including temperature, pH, specific conductance, turbidity, dissolved oxygen, and oxidation-reduction potential were continuously monitored with the use of a flow-through cell YSI Model 8260 Sonde and YSI Model 610 hand-held display unit. Field parameters were recorded at five-minute intervals to evaluate the time trend of these parameters and determine when the parameters stabilized. When the field parameters reached an approximately stable reading, the flow-through cell was taken off-line, and groundwater samples were immediately collected directly through the dedicated tubing into the laboratory-supplied bottles. Field Data Sheets are included as Appendix A.

Groundwater samples were laboratory analyzed for Site-related COIs, background constituents, and general chemistry/natural attenuation indicator parameters. Shallow-Zone groundwater sample parameters are presented in Table 2-2, and Deep-Zone groundwater sample parameters are presented in Table 2-3. Groundwater samples were collected in order of decreasing volatility of the parameter being analyzed. Sample bottles were immediately cooled after collection. Laboratory analyses were performed by SK (ENCOTEC, Ann Arbor, Michigan), a NJDEP-certified laboratory.

Quality assurance/quality control (QA/QC) samples were collected in accordance with the SAP (Table 2-4). QA/QC samples included trip blanks, field blanks, duplicate samples, and matrix spike/matrix spike duplicate analyses. QA/QC samples were prepared using analyte-free water supplied by the laboratory.

3. RESULTS

Results of the first quarter 1999 monitoring event are summarized below. The discussion is divided into two sections, Shallow-Zone and Deep-Zone.

3.1. SHALLOW ZONE

Results of Shallow-Zone monitoring are discussed below. The discussion is presented in three sections: Groundwater Flow, DNAPL Presence and Extent, and Groundwater Quality

3.1.1. GROUNDWATER FLOW

Depth to water measurements and potentiometric surface elevations are presented in Table 3-1. Groundwater potentiometric surface contour maps for the Shallow-Zone are shown in Figures 3-1a to 3-1k. .

The groundwater flow pattern consistently observed in the Shallow Zone during first quarter 1999 is very similar to that predicted by the groundwater flow and transport model included in the RAWP. The sheet pile wall and slurry wall has cut off groundwater flow from the Site to the Hackensack River. In the Eastern Area of the Site, flow has been redirected toward the south; in the Central and Western Areas, flow has been redirected towards the west. Water levels in the Shallow Zone have been observed to change temporally, which is believed to be due to the variability in groundwater recharge from precipitation. However, the flow pattern has remained consistent throughout first quarter 1999.

3.1.2. DNAPL PRESENCE AND EXTENT

DNAPL thickness measurements are presented in Table 3-2. DNAPL presence in the Shallow-Zone was observed only in the northeastern portion of the Site, which is consistent with historic observations. The DNAPL thickness monitoring confirms that the areal extent of DNAPL has not changed since the start of the monitoring period in 1998. Changes in apparent DNAPL thickness observed in Shallow-Zone wells during the reporting period are slight, and do not show a consistent trend over time.

3.1.3. GROUNDWATER QUALITY

Groundwater analytical results from the Shallow-Zone during the first quarter 1999 event are discussed in this section. The section is presented in two sub-sections; Compliance Wells and Monitoring Wells.

In general, the groundwater at the Site contains elevated concentrations of inorganic analytes that are generally characteristic of saltwater. The six most abundant constituents of saltwater (chloride, sodium, sulfate, magnesium, calcium, and potassium) were detected at similar ratios in the groundwater[4]. Due to the proximity of the Hackensack River, the saline characteristic of the groundwater is most likely a result of saltwater intrusion from the river. The groundwater quality at this Site is degraded due to natural background conditions, the mixing of fresh and saltwater, as well as the historical industrial land use in the area (local and regional).

The RAWP established that groundwater concentrations of various metals in both the shallow and deep zones were consistent with background levels in the vicinity of the Seaboard Site. Therefore, metals will be evaluated over-time to determine if the activities at the site are significantly altering the respective metal concentrations.

Total cyanide is included as an analyte in the SAP; however total cyanide at coal gasification sites historically has been shown to be comprised of ferro, ferric-cyanide complexes, which are very stable and non toxic. Both the State of New Jersey and the U.S. Environmental Protection Agency (EPA) express the recommended surface water quality criterion as free cyanide (63 FR 67548-67558 December 7, 1998). Therefore comparisons to groundwater and surface water standards will only be made for free cyanide.

3.1.3.1. Shallow Zone Compliance Wells

The first quarter 1999 Shallow-Zone groundwater data for Compliance Wells are discussed and compared with previous results where possible. A total of eight on-site monitoring wells are designated as Shallow Zone Compliance Wells. The Shallow Zone Compliance Well numbers are as follows: MW-102R, MW-103, MW-104, W-12R, MW-106, MW-113, P-19, and SWW-25.

Tables 3-3 through 3-6 contain a summary of the 1999 first quarter Shallow-Zone groundwater monitoring data. Table 3-3 summarizes the mean, number of measurements, and range of detected concentrations. Table 3-4 and 3-5 are sub-divided into four analyses categories, general chemistry, organics (volatiles), organics (semi-volatiles), and total metals. Table 3-6 presents historical data for available well locations and comparisons to the New Jersey Class SE-2 Surface Water Quality Criteria (SE-2 SWQC). In addition, wells with parameters exceeding the SE-2 SWQC are identified.

Groundwater samples were collected during the fourth quarter 1998 and first quarter 1999 using the same sampling methods, analytical laboratory, and analyte detection limits. The second quarter 1999 groundwater sampling event will provide additional data for making historical time series comparisons and identifying changes in parameter concentrations.

General Chemistry and Field Parameters

Results of general chemistry and field parameters for the shallow zone compliance wells are shown in Table 3-4. The general chemistry and field parameters include: total alkalinity, carbon dioxide, chloride, total and free cyanide, dissolved oxygen, iron (ferrous), methane, nitrate and nitrite, oxidation reduction potential, pH, specific conductivity, sulfate, temperature and turbidity. Two parameters common in saltwater, chloride and sulfate, were present in ratios similar with saltwater. No free cyanide was detected above the practical quantitation limit (PQL) or above the SE-2 SWQC for free cyanide of 1.0 ug/L.

Organics, Volatile

Generally the volatile organic compound (VOC) concentrations detected in groundwater have decreased compared to previous sampling events. In the first quarter 1999, VOCs in groundwater were not detected in six of the eight shallow zone compliance wells. Two wells (MW-102R and MW-104) reported low VOC concentrations. The compounds detected in compliance well MW-102R included 2-butanone (MEK) and acetone at concentrations of 84 ug/L and 260 ug/L, respectively. These compounds are thought to be laboratory artifacts. The compounds detected in compliance well MW-104 included benzene and ethylbenzene at concentrations of 10 ug/L and 26 ug/L, respectively. All four VOCs detected in the site compliance wells are below the SE-2 SWQC. The results of the shallow compliance well groundwater analyses are presented in Table 3-4. The laboratory data sheets and chain of custody records are presented in Appendix B.

Organics, Semi-Volatile

Generally the semi-volatile organic compound (SVOC) concentrations in groundwater have decreased compared to previous sampling events. In the first quarter 1999, SVOCs were not detected in five of the eight shallow zone compliance wells. Three wells (MW-102R, MW-104 and MW-113) reported low SVOC concentrations. The SVOC compound detected in groundwater in compliance well MW-102R included phenol (1,300 ug/L). The SVOC compound detected in compliance well MW-104 included acenaphthene (13 ug/L). The SVOC compounds detected in compliance well MW-113 included carbazole (15 ug/L), 2-methylnaphthalene (15 ug/L), naphthalene (26 ug/L), and phenanthrene (15 ug/L). All six SVOCs detected in the site compliance wells are below the SE-2

SWQC. The results of the shallow compliance well groundwater analyses are presented in Table 3-4. The laboratory data sheets and chain of custody records are presented in Appendix B.

Total Metals

Groundwater samples from all eight Shallow Zone Compliance Wells were collected and laboratory analyzed for 23 individual metals. A summary of the Shallow Zone Compliance Wells, 1st Quarter 1999 groundwater analytical results is presented in Table 3-4. A summary of detected parameters and comparison with historic data is presented in Table 3-6.

Four analytes common in saltwater, calcium, magnesium, potassium and sodium, were present in concentration ratios similar to saltwater. Seven analytes in the Shallow Zone Compliance Wells were not detected above the laboratory detection limits, including: antimony, beryllium, cobalt, selenium, silver, thallium, and vanadium.

In general, total metals concentrations in groundwater for the first quarter 1999 appear to be inconclusive, with increases observed at some wells, decreases at other wells, and some wells showing no substantive change. Future groundwater sampling events will provide additional data for making historical time series comparisons and identifying changes in parameter concentrations.

3.1.3.2. Shallow Zone Monitoring Wells

The first quarter 1999 Shallow-Zone groundwater data for Non-Compliance Monitoring Wells are discussed and compared with previous results when available. A total of eighteen on-site monitoring wells are designated as Shallow Zone Monitoring Wells. The Shallow Zone Monitoring Wells numbers are as follows: MW-108, MW-109, MW-110, MW-112, MW-116, MW-117, MW-118, MW-119, MW-120, MW-121, MW-122, WM-123, MW-124, MW-129, MW-130, P-24, P-25A, and MW-105.

Tables 3-3, 3-5 and 3-6 contain a summary of the 1999 first quarter Shallow-Zone groundwater monitoring data. Table 3-3 summarizes the mean, number of measurements, and range of detected concentrations. Table 3-5 is sub-divided into four analyses categories, general chemistry, organics (volatiles), organics (semi-volatiles), and total metals. Table 3-6 presents historical data for available well locations and comparisons to the New Jersey Class SE-2 Surface Water Quality Criteria (SE-2 SWQC). In addition, wells with parameters exceeding the SE-2 SWQC are identified.

Groundwater samples were collected during the fourth quarter 1998 and first quarter 1999 using the same sampling methods, analytical laboratory, and analyte detection limits. The second quarter 1999 groundwater sampling event will provide additional data for making historical time series comparisons and identifying changes in parameter concentrations.

General Chemistry and Field Parameters

Results of general chemistry and field parameters are shown in Table 3-5. The general chemistry and field parameters include: total alkalinity, carbon dioxide, chloride, total and free cyanide, dissolved oxygen, iron (ferrous), methane, nitrate and nitrite, oxidation reduction potential, pH, specific conductivity, sulfate, temperature and turbidity. Two parameters common in saltwater, chloride and sulfate, were present in concentration ratios similar with saltwater. The mean, number of measurements, and range of concentrations is summarized in Table 3-3.

Organics, Volatile

Groundwater samples from six of 18 wells (MW-105, MW-108, MW-109, MW-116, MW-124, and P-24) reported VOC concentrations above laboratory detection limitations (Table 3-5). The compounds identified include: acetone, benzene, chlorobenzene, ethylbenzene, toluene, and total xylenes. Acetone is recognized by the USEPA as a common laboratory artifact. In addition, chlorobenzene in MW-108 and MW-109 is likely due to migration from an off-site source in the western part of the site. The range of concentrations for VOCs in groundwater was 10 ug/L (total xylenes) to 2300 ug/L (benzene). The reported range of VOC concentrations has decreased slightly from the previous sampling event.

Organics, Semi-Volatile

Groundwater samples from 12 of 18 wells (MW-105, MW-108, MW-109, MW-110, MW-116, MW-118, MW-119, MW-121, MW-124, MW-129, MW-130 and P-24) reported SVOC concentrations above laboratory detection limits (Table 3-5). A total of 14 of the total 64 SVOC compounds were identified. The compounds identified include: acenaphthene, acenaphthylene, carbazole, dibenzofuran, 1,4-dichlorobenzene, 2,4-dimethylphenol, fluoranthene, fluorene, 2-methyl naphthalene, 2-methlyphenol, 4-methylphenol, naphthalene, phenanthrene and phenol. The reported SVOC concentrations ranged from 11 ug/L (acenaphthene) to 7000 ug/L (naphthalene). The reported range of SVOC concentrations has decreased slightly from the previous sampling event.

Total Metals

Groundwater samples from all eighteen Shallow Zone Monitoring Wells were collected and laboratory analyzed for 23 individual metals. A summary of the Shallow Zone Compliance Wells, 1st Quarter

1999 groundwater analytical results is presented in Table 3-5. A summary of detected parameters and comparison with historic data is presented in Table 3-6.

Four analytes common in saltwater, calcium, magnesium, potassium and sodium, were present in ratios similar with saltwater. Nine analytes were not detected in the Shallow Zone Monitoring Wells above the laboratory detection limits, including: antimony, beryllium, cadmium, cobalt, copper, nickel, selenium, silver, thallium, and vanadium.

In general, total metals concentrations in groundwater for the first quarter 1999 appear to be inconclusive, with increases observed at some wells, decreases at other wells, and some wells showing no substantive change. Future groundwater sampling events will provide additional data for making historical time series comparisons and identifying changes in parameter concentrations.

3.1.3.3. Natural Attenuation Indicator Parameters

Trends in hydraulic head data, shown in Figures 3-la through 3-lr, indicate that groundwater flow directions during the construction period are generally consistent with those predicted by the natural attenuation modeling in the RAWP. These data generally show the development of a groundwater mound in the eastern end of the site, through the fall of 1998. This mound results in a southward flow component, from the eastern end of the site.

Preliminary trends in groundwater chemistry data from compliance and monitor wells are generally consistent with the predicted behavior of groundwater and dissolved phase COIs, as predicted by natural attenuation modeling.

Comparison of redox-related data between wells also indicates the occurrence of natural attenuation reactions. The following provides a summary of mean concentrations for selected parameters from the first quarter 1999 data. Data are grouped on the basis of the detection or absence of COIs in groundwater at the monitoring location. As shown, mean concentrations of iron (ferrous), manganese and methane are higher for wells where COIs were detected. This trend is consistent with the production of these constituents through biodegradation reactions. Similarly, ORP readings tend to be lower in groundwater containing COIs, which is consistent with electron acceptor utilization through COI biodegradation. In the case of the sulfate, mean concentrations do show the expected trend: an increase is shown for the set of wells containing COIs. This is to be expected if sulfate acts as an electron acceptor during oxidative biodegradation of COIs. In addition, it is noted that site groundwater is generally high in sulfate and chloride, likely due to the influence of Hackensack River, which is known to have saline concentrations near saltwater.

Mean concentrations for selected redox-related parameters.

Redox-related parameters		Wells with Non-detectable COIs	Wells with Detectable COIs
Iron (ferrous) (ug/L)	Mean	16,400	22,600
	n	12	10
Manganese (ug/L)	Mean	910	998
	n	12	15
ORP (mV)	Mean	-54.1	-142
	n	12	15
Methane (ug/L)	Mean	2,940	4,230
	n	12	15
Sulfate (ug/L)	Mean	308,000	129,000
	n	11	15

Compliance well data for COIs was consistent with the transport predictions on the natural attenuation modeling: no substantive increase was observed for any parameter.

Figures 3.3 through 3.11 show the spatial distribution of total volatile and semi-volatile organic concentrations, carbon dioxide, methane, iron (ferrous), dissolved oxygen, oxidation reduction potential, pH, manganese, and sulfate. These isoplots compare the changes between the fourth quarter 1998 and first quarter 1999. As Figure 3.3 shows, there are two areas with notable concentrations of total volatile and semi-volatile organics. The maximum concentrations occur at MW-108 in the western end of the Site and MW-124 in the eastern end of the Site. The natural attenuation discussion will focus on MW-108 in the western end of the Site and MW-124 in the eastern end of the Site.

Western End of Site The following discussion will review the two quarters of data plotted in Figures 3.3 to 3.11. The plots indicate that both aerobic and anaerobic processes are operating in the western end of the Site. The total semi-volatile concentration increased from 2,100 ug/L to 2,190 ug/L, while the total volatile concentration increased from 61 ug/L to 358 ug/L between fourth quarter 1998 and first quarter 1999. This may be attributable to migration of VOC/SVOC constituents from a suspected off-site source.

Both carbon dioxide (Figure 3.4) and methane (Figure 3.5) exhibit maximum concentrations at MW-108 in the western end of the site. These two parameters are substantially higher than surrounding wells and provide evidence that organics in this area are undergoing oxidation by microbial pathways. While the carbon dioxide indicates aerobic microbial activity, the high methane is consistent with anaerobic processes and is supported by other parameters detected at MW-108. The high carbon dioxide is probably migrating from a nearby location where organics are undergoing aerobic oxidation. Another natural attenuation parameter, oxidation reduction potential (ORP) (Figure 3.8), is lower at well MW-108; indicating that the area is more anaerobic. The dissolved oxygen (Figure 3.7) at MW-108 is also lower than surrounding wells, consistent with the ORP data indicating an anaerobic environment. Another indication is the increase in pH (Figure 3.9) at MW-108 relative surrounding wells. An increase in pH is typically observed were anaerobic processes are taking place.

The reduction of ferrous iron (Figure 3.6) does not appear to play a significant role in the geochemistry in this end of the Site, since levels are lower relative to the eastern side. Figure 3.11 shows a substantially lower concentration of sulfate at MW-108 compared with MW-120. During field sampling MW-108 was observed to have a sulfur odor. The microorganisms in the groundwater around MW-108 may be reducing sulfate to sulfide explaining the odor observed during sample collection. Figure 3.10 shows that manganese is elevated in MW-109. This increase in manganese may be the result of anaerobic microorganisms using manganese (MN^{+4}) as a mineral electron acceptor[6]. This data suggests that intrinsic bioremediation is occurring under anaerobic conditions at or near the location of MW-108 in the western end of the Site.

Eastern End of Site The following discussion will review the two quarters of data plotted in Figures 3.2 to 3.11. The plots indicate that both aerobic and anaerobic processes are operating in the eastern end of the Site. The total semi-volatile concentration increased from 12,500 ug/L to 15,700 ug/L, while the total volatile concentration remain constant at 4,100 ug/L between fourth quarter 1998 and first quarter 1999. The data is more complex with respect natural attenuation processes on this side of the Site.

Both carbon dioxide (Figure 3.5) and methane (Figure 3.4) exhibit elevated concentrations in wells near MW-124 in the eastern end of the site. While the carbon dioxide indicates aerobic activity, the high methane is consistent with anaerobic processes and is supported by results of other parameters. Most likely there is a zone of aerobic activity and a zone of anaerobic activity at this side of the Site. Another natural attenuation parameter, the oxidation reduction potential (ORP) (Figure 3.8), is lower in wells MW-124 and P-24, indicating the area is becoming more anaerobic. Another indication is the lower dissolved oxygen (DO) (Figure 3.7) at MW-124 relative to surrounding wells, which is consistent with an anaerobic environment. Another indication is the slight increase in pH (Figure 3.9) near MW-124, P-24 and MW-129 relative surrounding wells. An increase in pH is typically observed were anaerobic processes are taking place.

Ferrous iron reaches a peak concentration of 74.5 mg/L at well MW-130. This value is considerably higher than surrounding wells. This higher value suggests that microorganisms are using ferric iron [Fe(III)] as an electron acceptor to carryout the oxidation of organics in the eastern side of the Site. Figure 3.11 shows lower concentrations of sulfate near MW-124 compared with the compliance wells.

During field sampling P-24 was observed to have a sulfur odor. The microorganisms in the groundwater around P-24 may be reducing sulfate to sulfide explaining the odor observed in the field. This data suggests that intrinsic bioremediation is occurring under anaerobic conditions at or near the location of MW-124.

Continued monitoring of natural attenuation parameters at the Site will provide a better understanding of the pathways that organic COIs are undergoing through microbial mineralization.

3.2. DEEP ZONE

Results of Deep-Zone monitoring are discussed below. The discussion is divided into three sub-sections; groundwater flow, DNAPL presence and extent, and groundwater quality.

3.2.1. GROUNDWATER FLOW

Depth to water measurements and potentiometric surface elevations are presented in Table 3-7. A groundwater potentiometric surface contour map for the Deep-Zone is shown in Figure 3-12. Groundwater flow patterns in the Deep-Zone during the reporting period were similar to those observed historically. The potentiometric surface indicate that deep zone groundwater flows to the west and south.

3.2.2. DNAPL PRESENCE AND EXTENT

DNAPL has been shown historically to be absent in the Deep-Zone. All DNAPL thickness measurements obtained from Deep-Zone monitoring wells during the reporting period confirmed the absence of DNAPL in the Deep-Zone.

3.2.3. GROUNDWATER QUALITY

Analytical results from the Deep-Zone during the first quarter 1999 event are discussed in this section. Similar to the Shallow-Zone, the Deep-Zone groundwater contains elevated concentrations of common metals and ions found in saltwater. In addition, the concentration of total dissolved solids indicate brackish water. The general chemistry data indicates that the composition of the deep water at this Site is influenced by the saline nature of the local surface saltwater environment. Due to the brackish nature of the Deep-Zone groundwater, chloride, sodium, and total dissolved solids, may exceed the New Jersey Class II-A Groundwater Quality Criteria (II-A GWQC).

3.2.3.1. Deep Zone Monitoring Wells

The first quarter 1999 Deep Zone groundwater data are discussed and compared with previous results when available. A total of seven on-site monitoring wells are designated as Deep Zone Monitoring Wells. The Deep Zone Monitoring Wells numbers are as follows: C-3, W-13R, W-17, W-25, W-29, W-30R, and W-31. Table 3-8 contains a summary of the 1999 first quarter Deep-Zone groundwater monitoring data. The table is divided into four analyses categories, general chemistry, organics (volatiles), organics, (semi-volatiles), and total metals. The (II-A GWQC) are also presented in the table. Wells with parameters exceeding the II-A GWQC are identified. The following is a discussion of the results for each category.

Groundwater samples were collected during the fourth quarter 1998 and first quarter 1999 using the same sampling methods, analytical laboratory, and analyte detection limits. Thus groundwater data collected during these two quarters represent similar data sets and allow for observations of changes in groundwater parameters. The second quarter 1999 groundwater sampling event will provide additional data for making historical time series comparisons and identifying changes in parameter concentrations.

General Chemistry and Field Parameters

Results of general chemistry and field parameters are shown in Table 3-8. The general chemistry and field parameters include: chloride, total and free cyanide, dissolved oxygen, oxidation reduction potential, pH, specific conductivity, temperature and turbidity. Chloride and total dissolved solids were detected in every sample at concentrations classified as slightly to moderately saline. The total dissolved solids (TDS) range from 1000 mg/L to 8000 mg/L. The chloride concentration range is 580 mg/L to 4700 mg/L. Both TDS and chloride were above the II-A GWQC. The ratio of saltwater constituents in the Deep-Zone groundwater indicate that there is likely some fresh and saltwater mixing[4]. Due to this mixing, TDS and chloride concentrations may exceed the II-A GWQC. None of the samples had detectable concentrations above the PQL for total or free cyanide.

Organics, Volatile

No volatile compounds were detected in the Deep Zone monitoring wells above the laboratory detection limitations (Table 3-8).

Organics, Semi-Volatile

Semi-volatile organic compounds were detected in two of seven Deep Zone wells (W-13R and W-29) (Table 3-8). The compounds identified include: acenaphthene, naphthalene, and phenol. None of the compounds detected exceeded the II-A GWQC. The range of concentrations for semi-volatile organic compounds was 11 ug/L (naphthalene) to 22 ug/L (phenol).

Total Metals

Groundwater samples from all seven Deep Zone Monitoring Wells were collected and laboratory analyzed for 23 individual metals. A summary of the Deep Zone Monitoring Wells, 1st Quarter 1999 groundwater analytical results is presented in Table 3-8.

Six of the twenty-three metals were not detected in the Deep Zone groundwater samples, including: antimony, chromium, mercury, selenium, silver, and thallium. Nine of the twenty-three metals were detected at no more than three locations: arsenic, beryllium, cadmium, cobalt, copper, lead, nickel, vanadium, and zinc. Eight of the twenty-three metals were detected in more than six samples: aluminum, barium, calcium, iron, magnesium, manganese, potassium, and sodium.

Five of the Deep-Zone wells (W-13R, W-17, W-25, W-29 and W-31) were previously sampled during the second quarter in 1997. One well, W-13R was also sampled in first quarter of 1998. A summary of detected parameters is presented in Table 3-9. The limited sampling history of these wells prevents the identification of significant trends in concentrations.

3.3. Field and Laboratory Quality Assurance and Quality Control (QA/QC)

Samples collected during the first quarter 1999 followed the procedures for field and laboratory quality assurance and quality control (QA/QC) specified in the sample and analysis plan (SAP) dated June 1998. The following sections summarize the QA/QC for both the field and laboratory.

3.3.1. Field QA/QC

Field QA/QC samples consisted of trip blanks, field blanks, and field duplicates. Ten trip blanks, two field blanks, and two field duplicates were collected and analyzed. One constituent of interest (COI), bis(2-ethylhexyl) phthalate, was detected in FB-01, however this compound was not detected in any of the samples. None of the trip blanks contained any COIs. Field duplicate samples were collected for monitoring wells MW-116 and P-24. In general, the relative percent difference (RPD) were acceptable ($\leq$ 20%) with the following exceptions:

- For sample MW-116, the sulfate RPD was approximately 24.7%, while the RPD for remaining parameters were under 20%.

- Free cyanide was only detected in the duplicate for P-24, and not in the original sample.

- Mercury was detected in P-24 the original sample and not in the duplicate sample.

- For P-24, free cyanide, total cyanide, iron (ferrous), lead, and mercury had RPDs of 123%, 105%, 24.3%, 38.6%, and 40% respectively; while the RPD for remaining parameters were under 20%.

See Table 3-10 for a complete summary of field duplicate RPD results. In general, the RPDs were acceptable.

3.3.2. LABORATORY QA/QC

All samples were analyzed within holding times. There were no target analytes detected in any of the laboratory method blanks. All laboratory control spike (LCS), matrix spike (MS) and matrix spike duplicates (MSD) met the EPA quality assurance guidelines. Samples collected in the field for MS/MSD analysis were wells MW-112 and W-31. A more complete summary of laboratory QA/QC is contained in the laboratory narrative in Appendix B.

4. SUMMARY/SCHEDULE

As described in Section 3.0, the results of the first quarter 1999 groundwater monitoring event were relatively consistent with previous monitoring results at the Site. In general, the concentration and number of organic COI decreased across the site. No Site-related organic constituents were detected above applicable standards in either the Shallow-Zone Compliance Wells (SE-2 SWQC) or the Deep-Zone Wells (II-A GWQC). Exceedances were noted for some inorganic parameters (mostly metals), however, concentrations of these parameters are distributed Site-wide, may be reflective of background and/or brackish groundwater conditions, and are not necessarily related to previous Site activities. For these reasons, re-sampling activities as specified in the RAP and SAP were not scheduled. The NJDEP was notified of these exceedances (via verbal communication) per RAWP and SAP requirements.

The second quarter sampling event was completed during the week of June 7 through 14, 1999. The NJDEP was notified prior to the initiation of sampling activities.

5. SUMMARY OF RAWP SITE ACTIVITIES

The following provides a summary of activities associated with the RAWP that were conducted throughout the first quarter of 1999. This summary is being submitted at the request of the NJDEP in lieu of submitting monthly status reports.

5.1. BARRIER WALL

Slurry Wall

Activities associated with obtaining necessary data to document conformance with RAWP requirements were conducted during the reporting period. These activities included the survey of the as-built centerline location of the slurry wall by a New Jersey licensed surveyor. In accordance with N.J.A.C. 7:26E-6.6, results and documentation of all appropriate field and laboratory QA\QC testing and measurements will be provided in a comprehensive Remedial Action Report (RAR).

Steel Sheet Pile Wall

Activities associated with obtaining necessary data to document conformance with RAWP requirements were conducted during the reporting period. Both as-built drawings and construction documentation were compiled during the reporting period. In accordance with N.J.A.C. 7:26E-6.6, results and documentation of all appropriate field QA\QC testing and measurements will be provided in a comprehensive Remedial Action Report (RAR).

PDM Key

No construction activities associated with the PDM key were completed during the reporting period. On January 18, 1999 results of a pre-construction field investigation along the alignment of the PDM key were forwarded to the NJDEP. Based on the data, minor modifications to the PDM Key were discussed at a meeting held with the NJDEP on January 21, 1999. A follow-up "PDM Key - Progress Update" was forwarded to the NJDEP on February 5, 1999 which included an implementation plan. The implementation plan included several NJDEP conditions discussed at the January 21, 1999 meeting. Construction activities are anticipated to be conducted in the second or third quarter of 1999. The NJDEP will be notified in advance of construction activities.

Monitoring

Weekly inspection conducted throughout conducted generally during low tide conditions did not reveal leakage of DNAPL on the outboard side of the SSP.

5.2. TANK\BUILDING DEMOLITION

Tank

Removal of tank contents commenced during the reporting period. A majority of the tank contents had been removed and transported to the Safety Kleen TSD facility in Sarnia Ontario.

Building Demolition

SK completed the bidding and local permitting necessary for asbestos abatement and demolition of the existing former Koppers facility buildings during the reporting period.

5.3. PDM SURFACE COVER

A request for a temporary zoning approval to place PDM in additional areas of the Eastern portion of the site was conditionally approved by the HMDC. The temporary request originated from the need to divert surface water from directly infiltrating into the groundwater table in the east area so that SSP and slurry wall overtopping with groundwater could be prevented. SK placed PDM in the permitted area in accordance with the HMDC conditions during the reporting period. In order to construct stormwater outfall structures, a Nationwide Permit from the Army Corps of Engineers was obtained. Final design for the basin outlet facilities was initiated during the reporting period.

5.4. AREA OF CONTAMINATION (AOC)

As specified in the RAWP, slurry trench spoil, waste piles, sediments and dike material generated from the SSP starter trench have been placed in the AOC. Large debris (timbers and steel etc) were removed from the materials. Due to larger than expected volumes of materials generated from constructing the slurry wall deeper than planned and the steel sheet pile wall starter trench, a modification to the AOC was necessary in the eastern area of the site. Locations of the materials will be surveyed, graded and covered with PDM. It is anticipated that construction within the AOC will not be complete until all designated waste piles, and river sediments are addressed as specified in the RAWP and as discussed in their respective sections.

5.5. SEDIMENTS

No construction activity associated with the sediments were conducted during the reporting period. Sediment remediation will commence once the AOCE Section 10 and 404 wetlands permit have been obtained.

5.6. WASTE PILES

The majority of the designated waste piles are located either directly in adjacent to wetlands. Some designated waste materials are located in the intertidal zone. Due to their locations, remediation activities cannot commence until the AOCE Section 10 and 404 wetlands permit have been obtained.

5.7. INTERIM REMEDIAL MEASURES (IRM) SYSTEM OPERATION

The IRM operated throughout the reporting period with the exception of several short term shut-down periods required for modifications\repairs. Table 5-1 lists the cumulative shutdown period of the IRM system. This time will be added to the operation time specified in the RAWP.

5.8. SCHEDULE

A revised schedule is provided as figure 5-1 of this report. Please note that many of the RAWP activities are contingent on obtaining the ACOE Section 10/404 permit.

6. REFERENCES

1. May 7, 1998. NJDEP Conditional Approval of April 2, 1998 Remedial Action Work Plan: Former Koppers Seaboard Site, Kearny, New Jersey, Key Environmental

2. June 1998. Sampling and Analysis Plan: Former Koppers Seaboard Site, Kearny, New Jersey, Key Environmental

3. U.S. Environmental Protection Agency Region II, Groundwater Sampling Procedures: Low-flow Purging and Sampling

4. Study and Interpretation of the Chemical Characteristics of Natural Water, Third Edition, United States Geological Survey Water-Supply Paper 2254

5. Geology and Ground-water Resources of the Rahway Area, New Jersey, Special report No. 27, 1968, U.S. Geological Survey

6. Ground-water Microbiology & Geochemistry, Francis H. Chapelle, John Wiley & Sons, 1993.

TABLES

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TABLE 2-1
MONITORING WELL FUNCTIONS
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Well ID	Water Level Monitoring	Groundwater Sampling and Analysis	DNAPL Thickness Monitoring	Comments
Shallow Zone Wells				
MW-100	x			
MW-101	x			
MW-102R	x	x		
MW-103	x	x		
MW-104	x	x		
MW-105	x	x		
MW-106	x	x		
MW-108	x	x		
MW-109	x	x		
MW-110	x	x		
MW-111	x			
MW-112	x	x	x	
MW-113	x	x		
MW-114	x (1)	x (1)		Not yet installed
MW-115	x		x	DNAPL in well: MW-130 replaces for sampling
MW-116	x	x	x	
MW-117	x	x	x	
MW-118	x	x	x	
MW-119	x	x		
MW-120	x	x		
MW-121	x	x		
MW-122	x	x		
MW-123	x	x		
MW-124	x	x		
MW-125	x			
MW-126	x			
MW-127	x			
MW-128	x			
MW-129	x	x	x	
MW-130	x	x	x	Replaces MW-115 for sampling and analysis
P-19	x	x		
P-20	x		x	
P-22	x		x	
P-24	x	x	x	
P-25A	x	x		
SWW-5.1	x		x	
SWW-25	x	x		
W-9	x		x	
W-12R	x	x		
W-27	x		x	
Deep Zone Wells				
C-3	x	x	x	
SWW-6.5	x		x	
SWW-7.5	x		x	
SWW-9	x		x	
W-13R	x	x	x	
W-17	x	x		
W-25	x	x	x	
W-29	x	x	x	
W-30	x	x		
W-31	x	x		

NOTES:
(1) MW-114 is to be implemented into these phases of monitoring when installed

TABLE 2-2
SHALLOW ZONE GROUNDWATER ANALYTICAL PARAMETERS
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Parameter	Method
Constituents of interest	
TCL VOCs	EPA Method 624
TCL SVOCs	EPA Method 625
TAL Metals	EPA Method 200.7
Total cyanide	EPA Method 335.1/335.2
Free cyanide	SM 4500-CN (I)
Natural attenuation indicators / general chemistry parameters	
pH, specific conductance, temperature, dissolved oxygen, redox potential, turbidity	Field parameters (in conjunction with low flow methods and flow-through cell)
alkalinity	EPA Method 310.2/310.1
nitrate	EPA Method 353.2/353.3
sulfate	EPA Method 375.4
manganese	EPA Method 200.7 (w/ metals)
ferrous iron	SM 3500-Fe.D
methane	EPA Method 8015
carbon dioxide	ASTM D-4500
chloride	EPA Method 325.1/325.3

TABLE 2-3
DEEP ZONE GROUNDWATER ANALYTICAL PARAMETERS
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Parameter	Method
Constituents of interest	
TCL VOCs	EPA Method 624
TCL SVOCs	EPA Method 625
TAL Metals	EPA Method 200.7
Total cyanide	EPA Method 335.1/335.2
Free cyanide	SM 4500-CN (I)
Natural attenuation indicators / general chemistry parameters	
pH, specific conductance, temperature, dissolved oxygen, redox potential, turbidity	Field parameters (in conjunction with low flow methods and flow-through cell)
total dissolved solids	EPA Method 160.1
chloride	EPA Method 325.1/325.3

TABLE 2-4
SUMMARY OF QA/QC SAMPLING
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

QA / QC Sample Type	Frequency of Collection	Analytical Parameters
Trip Blank	1 per sample shipment / cooler	TCL VOCs
Field Blank	1 per 20 primary samples	all COIs
Duplicate	1 per 20 primary samples	all
MS / MSD	1 per 20 primary samples	TCL VOCs, TCL SVOCs, TAL metals

TAB[illegible]
SHALLOW ZONE GROUN[illegible] ELEVATION DATA
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Date:	8/18 - 9/10/98		1/7/99		1/14/99		1/22/99		1/29/99	
Well ID	TOC Elev. (ft msl)	Ref.	Depth to Water (ft-toc)	Groundwater Elevation ((ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation ((ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation ((ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation ((ft-msl)
MW-100	6.43	1	2.12	4.31	NM	NM	1.86	4.57	NM	NM
MW-101	8.74	1, 2	4.03	4.71	NM	NM	3.77	4.97	NM	NM
MW-102R	13.53	2	8.40	5.13	NM	NM	7.84	5.69	NM	NM
MW-103	9.66	1	4.58	5.08	4.58	5.08	4.13	5.53	4.16	5.50
MW-104	7.09	1	2.06	5.03	2.04	5.05	1.56	5.53	1.62	5.47
MW-105	8.46	1	3.60	4.86	3.74	4.72	2.45	6.01	3.15	5.31
MW-106	8.34	1	3.32	5.02	3.21	5.13	2.56	5.78	2.42	5.92
MW-108	7.05	1	4.33	2.72	NM	NM	4.12	2.93	NM	NM
MW-109	7.23	1	4.54	2.69	NM	NM	4.15	3.08	NM	NM
MW-110	10.29	1	6.33	3.96	NM	NM	6.12	4.17	NM	NM
MW-111	7.93	1, 2	3.45	4.48	NM	NM	3.19	4.74	NM	NM
MW-112	11.22	1	6.50	4.72	6.69	4.53	6.11	5.11	5.75	5.47
MW-113	11.34	2	7.75	3.59	7.76	3.58	7.22	4.12	7.25	4.09
MW-114	NI		NM	NI	NI	NI	NM	NI	NI	NI
MW-115	9.39	2	3.84	5.55	3.80	5.59	3.10	6.29	4.31	5.08
MW-116	9.13	2	3.89	5.24	3.88	5.25	3.28	5.85	3.43	5.70
MW-117	21.01	2	15.64	5.37	15.54	5.47	14.83	6.18	14.76	6.25
MW-118	10.93	2	5.62	5.31	5.59	5.34	4.31	6.62	4.10	6.83
MW-119	7.70	2	3.90	3.80	NM	NM	3.70	4.00	NM	NM
MW-120	7.37	2	5.26	2.11	NM	NM	5.15	2.22	NM	NM
MW-121	7.62	2	5.80	1.82	NM	NM	5.07	2.55	NM	NM
MW-122	6.77	2	4.09	2.68	NM	NM	3.74	3.03	NM	NM
MW-123	6.49	2	3.70	2.79	NM	NM	3.35	3.14	NM	NM
MW-124	18.23	2	12.87	5.36	12.78	5.45	12.27	5.96	12.21	6.02
MW-125	13.53	2	10.81	2.89	NM	NM	10.51	3.19	NM	NM
MW-126	13.39	2	9.84	3.77	NM	NM	9.54	4.07	NM	NM
MW-127	8.88	2	6.29	2.59	NM	NM	5.32	3.56	NM	NM
MW-128	6.43	2	2.87	3.56	NM	NM	2.71	3.72	NM	NM
MW-129	19.98	2	14.74	5.24	14.68	5.30	14.12	5.86	14.10	5.88
MW-130	13.86	2	8.62	5.24	8.61	5.25	8.02	5.84	8.08	5.78
P-19	15.67	2	10.77	4.90	10.70	4.97	10.39	5.28	10.32	5.35
P-20	7.57	2	2.12	5.45	2.02	5.55	1.49	6.08	1.95	5.62
P-22	10.95	2	5.39	5.56	5.44	5.51	3.88	7.07	3.84	7.11
P-22R	*		NI	NI	NI	NI	NI	NI	NI	NI
P-24	17.42	2,3	16.99	5.07	16.93	5.13	16.30	5.76	16.20	5.86
P-25A	8.54	2	4.85	3.69	4.92	3.62	4.19	4.35	4.40	4.14
SWW-5.1R	11.41	2	6.45	4.96	6.32	5.09	5.53	5.88	5.44	5.97
SWW-25	14.45	2	9.43	5.02	9.36	5.09	8.71	5.74	8.79	5.66
W-9	8.22	2	2.50	5.72	2.40	5.82	1.41	6.81	1.39	6.83
W-12R	10.76	2	5.62	5.14	5.53	5.23	4.88	5.88	4.79	5.97
W-27	7.56	2	1.93	5.63	1.83	5.73	1.10	6.46	2.62	4.94

NOTES: 1) Surveyed by Casey & Keller, August 1997
2) Surveyed by Casey & Keller, August-September 1998
3) Surveyed by Casey & Keller, November 1998
4) TOC = top of casing
5) ft-toc = feet below top of casing
6) ft-msl = feet above mean sea level
7) NI = well was not installed on measurement date
8) * = approximate values - wells were refurbished; survey data forthcoming
9) NM = No Measeurement Taken
10) Reference elevations for groundwater quality monitoring after 11/24/98 are corrected by 0.06 feet due to the installation of sampling pumps.

932220113

TABI
SHALLOW ZONE GROUNL ‹ ELEVATION DATA
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Date:	8/18 - 9/10/98		2/4/99		2/12/99		2/19/99		2/26/99	
Well ID	TOC Elev. (ft msl)	Ref.	Depth to Water (ft-toc)	Groundwater Elevation ((ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation ((ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation ((ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation ((ft-msl)
MW-100	6.43	1	1.71	4.72	NM	NM	2.76	3.67	NM	NM
MW-101	8.74	1, 2	3.57	5.17	NM	NM	3.60	5.14	NM	NM
MW-102R	13.53	2	7.91	5.62	NM	NM	8.04	5.49	NM	NM
MW-103	9.66	1	4.20	5.46	4.40	5.26	4.34	5.32	4.48	5.18
MW-104	7.09	1	1.63	5.46	1.82	5.27	1.75	5.34	1.92	5.17
MW-105	8.46	1	3.02	5.44	3.50	4.96	3.07	5.39	3.66	4.80
MW-106	8.34	1	2.33	6.01	2.59	5.75	2.65	5.69	2.87	5.47
MW-108	7.05	1	4.12	2.93	NM	NM	4.33	2.72	NM	NM
MW-109	7.23	1	4.11	3.12	NM	NM	4.39	2.84	NM	NM
MW-110	10.29	1	6.03	4.26	NM	NM	6.05	4.24	NM	NM
MW-111	7.93	1, 2	2.98	4.95	NM	NM	3.02	4.91	NM	NM
MW-112	11.22	1	6.00	5.22	6.13	5.09	5.99	5.23	6.09	5.13
MW-113	11.34	2	7.12	4.22	7.43	3.91	7.23	4.11	7.50	3.84
MW-114	NI		NM	NI	NI	NI	NM	NI	NI	NM
MW-115	9.39	2	4.26	5.13	4.51	4.88	4.35	5.04	4.57	4.82
MW-116	9.13	2	3.56	5.57	3.83	5.30	3.66	5.47	3.91	5.22
MW-117	21.01	2	14.76	6.25	15.15	5.86	13.03	6.00*	13.35	5.68
MW-118	10.93	2	3.95	6.98	4.56	6.37	4.35	6.58	5.07	5.86
MW-119	7.70	2	3.58	4.12	NM	NM	3.57	4.13	NM	NM
MW-120	7.37	2	5.09	2.28	NM	NM	5.04	2.33	NM	NM
MW-121	7.62	2	4.68	2.94	NM	NM	5.38	2.24	NM	NM
MW-122	6.77	2	3.69	3.08	NM	NM	3.79	2.98	NM	NM
MW-123	6.49	2	3.23	3.26	NM	NM	3.40	3.09	NM	NM
MW-124	18.23	2	12.26	5.97	12.50	5.73	12.46	5.77	12.62	5.61
MW-125	13.53	2	10.39	3.31	NM	NM	10.41	3.29	NM	NM
MW-126	13.39	2	9.48	4.13	NM	NM	9.46	4.15	NM	NM
MW-127	8.88	2	5.12	3.76	NM	NM	5.46	3.42	NM	NM
MW-128	6.43	2	2.65	3.78	NM	NM	2.66	3.77	NM	NM
MW-129	19.98	2	14.14	5.84	14.38	5.60	14.32	5.66	14.49	5.49
MW-130	13.86	2	8.15	5.71	8.41	5.45	8.30	5.56	8.50	5.36
P-19	15.67	2	10.34	5.33	10.49	5.18	10.45	5.22	10.55	5.12
P-20	7.57	2	2.02	5.55	2.40	5.17	2.02	5.55	2.41	5.16
P-22	10.95	2	3.40	7.55	3.89	7.06	4.04	6.91	4.54	6.41
P-22R	*		NI	NI	NI	NI	NI	NI	NI	NI
P-24	17.42	2,3	16.20	5.86	16.40	5.66	16.49	5.57	16.64	5.42
P-25A	8.54	2	4.27	4.27	4.64	3.90	4.40	4.14	4.76	3.78
SWW-5.1R	11.41	2	5.38	6.03	5.83	5.58	5.65	5.76	6.03	5.38
SWW-25	14.45	2	8.76	5.69	9.03	5.42	8.93	5.52	9.18	5.27
W-9	8.22	2	1.02	7.20	1.43	6.79	1.41	6.81	1.80	6.42
W-12R	10.76	2	4.73	6.03	5.00	5.76	5.01	5.75	5.24	5.52
W-27	7.56	2	2.64	4.92	2.80	4.76	2.61	4.95	2.81	4.75

NOTES: 1) Surveyed by Casey & Keller, August 1997
2) Surveyed by Casey & Keller, August-September 1998
3) Surveyed by Casey & Keller, November 1998
4) TOC = top of casing
5) ft-toc = feet below top of casing
6) ft-msl = feet above mean sea level
7) NI = well was not installed on measurement date
8) * = approximate values - wells were refurbished; survey data forthcoming
9) NM = No Measurement Taken
10) Reference elevations for groundwater quality monitoring after 11/24/98 are corrected by 0.06 feet due to the installation of sampling pumps.

932220114

TABI[illegible]
SHALLOW ZONE GROUND[illegible]ER ELEVATION DATA
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Date:	8/18 - 9/10/98		3/2/99		3/11/99		3/18/99		3/23/99	
Well ID	TOC Elev. (ft msl)	Ref.	Depth to Water (ft-toc)	Groundwater Elevation ((ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation ((ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation ((ft-msl)	Depth to Water (ft-toc)	Groundwater Elevation ((ft-msl)
MW-100	6.43	1	1.76	4.67	NM	NM	1.82	4.61	1.84	4.59
MW-101	8.74	1, 2	3.65	5.09	NM	NM	3.88	4.86	3.88	4.86
MW-102R	13.53	2	8.19	5.34	NM	NM	8.16	5.37	8.08	5.45
MW-103	9.66	1	4.43	5.23	4.48	5.18	4.41	5.25	4.39	5.27
MW-104	7.09	1	1.86	5.23	1.90	5.19	1.87	5.22	1.79	5.30
MW-105	8.46	1	3.36	5.10	3.74	4.72	3.45	5.01	2.43	6.03
MW-106	8.34	1	2.85	5.49	2.84	5.50	2.86	5.48	2.79	5.55
MW-108	7.05	1	4.47	2.58	NM	NM	4.55	2.50	4.32	2.73
MW-109	7.23	1	4.50	2.73	NM	NM	4.43	2.80	4.23	3.00
MW-110	10.29	1	6.07	4.22	NM	NM	6.07	4.22	6.13	4.16
MW-111	7.93	1, 2	3.04	4.89	NM	NM	3.18	4.75	3.21	4.72
MW-112	11.22	1	6.00	5.22	6.51	4.71	6.33	4.89	6.24	4.98
MW-113	11.34	2	7.30	4.04	7.43	3.91	7.25	4.09	7.14	4.20
MW-114	NI		NM	NI	NI	NI	NM	NI	NM	NI
MW-115	9.39	2	4.52	4.87	4.34	5.05	4.38	5.01	4.72	4.67
MW-116	9.13	2	3.83	5.30	3.88	5.25	3.81	5.32	3.64	5.49
MW-117	21.01	2	13.18	5.85*	13.32	5.71	13.12	5.91*	12.98	6.05*
MW-118	10.93	2	4.70	6.23	5.08	5.85	4.70	6.23	5.68	5.25
MW-119	7.70	2	3.56	4.14	NM	NM	3.64	4.06	3.69	4.01
MW-120	7.37	2	5.10	2.27	NM	NM	5.03	2.34	5.11	2.26
MW-121	7.62	2	5.49	2.13	NM	NM	5.45	2.17	5.20	2.42
MW-122	6.77	2	3.81	2.96	NM	NM	3.82	2.95	3.81	2.96
MW-123	6.49	2	3.39	3.10	NM	NM	3.38	3.11	3.41	3.08
MW-124	18.23	2	12.55	5.68	12.60	5.63	12.49	5.74	12.51	5.72
MW-125	13.53	2	10.47	3.23	NM	NM	10.45	3.25	10.30	3.40
MW-126	13.39	2	9.49	4.12	NM	NM	9.52	4.09	9.48	4.13
MW-127	8.88	2	5.54	3.34	NM	NM	5.50	3.38	5.34	3.54
MW-128	6.43	2	2.66	3.77	NM	NM	2.67	3.76	2.66	3.77
MW-129	19.98	2	14.42	5.56	14.47	5.51	14.34	5.64	14.29	5.69
MW-130	13.86	2	8.40	5.46	8.49	5.37	8.36	5.50	8.27	5.59
P-19	15.67	2	10.52	5.15	10.54	5.13	10.50	5.17	10.56	5.11
P-20	7.57	2	2.20	5.37	2.14	5.43	1.95	5.62	1.15	6.42
P-22	10.95	2	4.38	6.57	4.41	6.54	4.18	6.77	4.06	6.89
P-22R	*		NI	NI	NI	NI	NI	NI	NI	NI
P-24	17.42	2,3	16.56	5.50	16.58	5.48	16.46	5.60	16.42	5.64
P-25A	8.54	2	4.45	4.09	4.67	3.87	4.47	4.07	4.27	4.27
SWW-5.1R	11.41	2	5.86	5.55	6.00	5.41	5.80	5.61	5.58	5.83
SWW-25	14.45	2	9.10	5.35	9.16	5.29	9.11	5.34	8.99	5.46
W-9	8.22	2	1.63	6.59	1.59	6.63	1.60	6.62	1.20	7.02
W-12R	10.76	2	5.19	5.57	5.22	5.54	5.20	5.56	5.13	5.63
W-27	7.56	2	2.75	4.81	2.59	4.97	3.00	4.56	2.15	5.41

NOTES: 1) Surveyed by Casey & Keller, August 1997
2) Surveyed by Casey & Keller, August-September 1998
3) Surveyed by Casey & Keller, November 1998
4) TOC = top of casing
5) ft-toc = feet below top of casing
6) ft-msl = feet above mean sea level
7) NI = well was not installed on measurement date
8) * = approximate values - wells were refurbished; survey data forthcoming
9) NM = No Measeurement Taken
10) Reference elevations for groundwater quality monitoring after 11/24/98 are corrected by 0.06 feet due to the installation of sampling pumps.

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TABLE 3-2
DNAPL THICKNESS DATA
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Date:	1/7/99			1/22/99		
Well ID	Depth to DNAPL (ft-toc)	Total Depth (ft-toc)	DNAPL Thickness (ft)	Depth to DNAPL (ft-toc)	Total Depth (ft-toc)	DNAPL Thickness (ft)
Shallow Zone						
MW-112	NP	14.70	NP	NP	NM	NP
MW-115	11.85	15.67	3.82	11.78	15.60	3.82
MW-116	NP	12.46	NP	NP	12.46	NP
MW-117	NP	NM	NP	NP	NM	NP
MW-118	NP	NM	NP	NP	NM	NP
MW-129	NP	22.22	NP	NP	NM	NP
MW-130	NP	16.76	NP	NP	NM	NP
P-20	8.46	17.29	8.83	7.51	17.28	9.77
P-22	NP	16.07	NP	NP	NM	NP
P-24	NP	29.85	NP	NP	30.10	NP
SWW-5.1R	NP	13.62	NP	NP	NM	NP
W-9	9.15	10.71	1.56	10.10	10.71	0.61
W-27	10.94	16.45	5.51	10.80	16.40	5.60
Deep Zone						
C-3	NP	78.00	NP	NP	NM	NP
SWW-6.5	NP	61.50	NP	NP	NM	NP
SWW-7.5	NP	80.55	NP	NP	NM	NP
SWW-9	NP	74.92	NP	NP	NM	NP
W-13R	NP	80.20	NP	NP	NM	NP
W-25	NP	68.65	NM	NP	NM	NM
W-29	NP	74.70	NP	NP	NM	NP

NOTES:
1) ft-toc = feet below top of casing
2) NP = no product detected
3) NI = well was not installed on measurement date
4) * = DNAPL was observed throughout water column
5) Monitoring well W-9 was refurbished before 9/1/98 gauging event
6) NM = not measured

TABLE 3-2
DNAPL THICKNESS DATA
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Date:	2/4/99			2/19/99		
Well ID	Depth to DNAPL (ft-toc)	Total Depth (ft-toc)	DNAPL Thickness (ft)	Depth to DNAPL (ft-toc)	Total Depth (ft-toc)	DNAPL Thickness (ft)
Shallow Zone						
MW-112	NP	14.70	NP	NP	14.70	NP
MW-115	11.99	15.67	3.68	11.78	15.67	3.89
MW-116	NP	12.46	NP	NP	12.46	NP
MW-117	NP	NM	NP	NP	NM	NP
MW-118	NP	NM	NP	NP	NM	NP
MW-129	NP	22.22	NP	NP	22.22	NP
MW-130	NP	16.76	NP	NP	16.76	NP
P-20	8.45	17.29	8.84	9.21	17.29	8.08
P-22	NP	16.07	NP	NP	16.07	NP
P-24	NP	29.85	NP	NP	29.85	NP
SWW-5.1R	NP	13.62	NP	NP	13.62	NP
W-9	9.78	10.71	0.93	10.28	10.71	0.43
W-27	10.87	16.45	5.58	10.92	16.45	5.53
Deep Zone						
C-3	NP	78.00	NP	NP	78.00	NP
SWW-6.5	NP	61.50	NP	NP	61.50	NP
SWW-7.5	NP	80.55	NP	NP	80.55	NP
SWW-9	NP	74.92	NP	NP	74.92	NP
W-13R	NP	80.20	NP	NP	80.20	NP
W-25	NP	68.65	NM	NP	68.65	NM
W-29	NP	74.70	NP	NP	74.70	NP

NOTES:
1) ft-toc = feet below top of casing
2) NP = no product detected
3) NI = well was not installed on measurement date
4) * = DNAPL was observed throughout water column
5) Monitoring well W-9 was refurbished before 9/1/98 gauging event
6) NM = not measured

TABLE 3-2
DNAPL THICKNESS DATA
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Date:	3/2/99			3/18/99			3/23/99		
Well ID	Depth to DNAPL (ft-toc)	Total Depth (ft-toc)	DNAPL Thickness (ft)	Depth to DNAPL (ft-toc)	Total Depth (ft-toc)	DNAPL Thickness (ft)	Depth to DNAPL (ft-toc)	Total Depth (ft-toc)	DNAPL Thickness (ft)
Shallow Zone									
MW-112	NP	14.70	NP	NP	14.70	NP	NP	14.70	NP
MW-115	11.73	15.67	3.94	13.18	15.67	2.49	13.31	15.67	2.36
MW-116	NP	12.46	NP	NP	12.46	NP	NP	12.46	NP
MW-117	NP	NM	NP	NP	NM	NP	NP	NM	NP
MW-118	NP	NM	NP	NP	NM	NP	NP	NM	NP
MW-129	NP	22.22	NP	NP	22.22	NP	NP	22.22	NP
MW-130	NP	16.76	NP	NP	16.76	NP	NP	16.76	NP
P-20	10.09	17.29	7.20	11.23	17.29	6.06	10.98	17.29	6.31
P-22	NP	16.07	NP	NP	16.07	NP	NP	16.07	NP
P-24	NP	29.85	NP	NP	29.85	NP	NP	29.85	NP
SWW-5.1R	NP	13.62	NP	NP	13.62	NP	NP	13.62	NP
W-9	10.42	10.71	0.29	10.50	10.71	0.21	10.78	10.71	0.07
W-27	10.88	16.45	5.57	10.80	16.45	5.65	10.93	16.45	5.52
Deep Zone									
C-3	NP	78.00	NP	NP	78.00	NP	NP	78.00	NP
SWW-6.5	NP	61.50	NP	NP	61.50	NP	NP	61.50	NP
SWW-7.5	NP	80.55	NP	NP	80.55	NP	NP	80.55	NP
SWW-9	NP	74.92	NP	NP	74.92	NP	NP	74.92	NP
W-13R	NP	80.20	NP	NP	80.20	NP	NP	80.20	NP
W-25	NP	68.65	NM	NP	68.65	NM	NP	68.65	NM
W-29	NP	74.70	NP	NP	74.70	NP	NP	74.70	NP

NOTES:
1) ft-toc = feet below top of casing
2) NP = no product detected
3) NI = well was not installed on measurement date
4) * = DNAPL was observed throughout water column
5) Monitoring well W-9 was refurbished before 9/1/98 gauging event
6) NM = not measured

Table 3-3 Summary of Mean, Number of Samples, and Range of Concentrations for Field, General Chemisrty and Metals in the Shallow and Deep Groundwater Zones

Parameter Name	Units	Mean	N	Range Min	Range Max
Groundwater Zone: SHALLOW					
Well Type: Compliance					
Alkalinity, Total	ug/L as CaCO	346,250.00	8	130,000.00	530,000.00
Calcium	ug/L	177,500.00	8	110,000.00	290,000.00
Carbon Dioxide	mg/L	462.75	8	210.00	721.00
Chloride	mg/L	1,617.50	8	180.00	5,100.00
Cyanide, Total	ug/L	54.14	7	11.00	220.00
Dissolved Oxygen (DO)	mg/L	0.66	8	0.23	1.25
Iron	ug/L	22,300.00	8	3,400.00	42,000.00
Iron (Ferrous)	mg/L	10.80	6	2.90	18.00
Magnesium	ug/L	49,875.00	8	23,000.00	110,000.00
Manganese	ug/L	926.25	8	390.00	2,400.00
Methane	mg/L	1.14	8	0.15	2.95
Oxidation Reduction Potential	mV	-132.81	8	-353.50	-62.10
pH	SU	6.98	8	6.49	8.43
Potassium	ug/L	139,000.00	8	17,000.00	620,000.00
Sodium	ug/L	911,250.00	8	110,000.00	3,100,000.00
Specific Conductivity	uS	5.85	8	1.51	15.90
Sulfate	ug/L	220,250.00	8	18,000.00	430,000.00
Turbidity	NTU	17.24	8	2.60	76.30
Well Type: Monitoring					
Alkalinity, Total	ug/L as CaCO	420,222.22	18	84,000.00	1,400,000.00
Calcium	ug/L	129,647.06	17	45,000.00	270,000.00
Carbon Dioxide	mg/L	432.83	18	123.00	1,220.00
Chloride	mg/L	1,287.56	18	66.00	4,100.00
Cyanide, Free	ug/L	15.50	2	12.00	19.00
Cyanide, Total	ug/L	94.36	14	12.00	560.00
Dissolved Oxygen (DO)	mg/L	1.00	18	0.18	3.96
Iron	ug/L	31,146.67	18	240.00	100,000.00
Iron (Ferrous)	mg/L	25.49	15	0.40	74.50
Magnesium	ug/L	73,055.56	18	15,000.00	330,000.00
Manganese	ug/L	1,040.72	18	29.00	3,500.00
Methane	mg/L	3.87	18	0.06	11.90
Oxidation Reduction Potential	mV	-102.24	18	-331.50	57.40
pH	SU	6.70	18	5.84	8.51
Potassium	ug/L	62,938.89	18	5,200.00	170,000.00
Sodium	ug/L	796,666.67	18	42,000.00	2,400,000.00
Specific Conductivity	uS	4.94	18	0.78	15.60
Sulfate	ug/L	188,500.00	18	11,000.00	780,000.00
Turbidity	NTU	42.36	18	0.50	411.10

Parameter Name	Units	Mean	N	Range Min	Range Max
Groundwater Zone: DEEP					
Well Type: Compliance					
Calcium	ug/L	477,142.86	7	90,000.00	1,900,000.00
Chloride	mg/L	1,844.29	7	580.00	4,700.00
Dissolved Oxygen (DO)	mg/L	1.17	7	0.41	1.87
Iron	ug/L	118,485.00	6	610.00	650,000.00
Magnesium	ug/L	167.000.00	6	20,000.00	390,000.00
Manganese	ug/L	5,268.33	6	340.00	26,000.00
Oxidation Reduction Potential	mV	-73.89	7	-127.80	-7.70
pH	SU	7.94	7	6.87	11.99
Potassium	ug/L	42,583.33	6	7,900.00	120,000.00
Sodium	ug/L	815,714.29	7	190,000.00	2,600,000.00
Solids, Total Dissolved	mg/L	3,028.57	7	1,000.00	8,000.00
Specific Conductivity	uS	8.70	7	2.19	26.59
Turbidity	NTU	589.26	7	35.60	1,787.60

TABLE 3-4. Summary of Shallow Zone Compliance Wells, 1st Quarter 1999

SK Services (East), L.C.

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Laboratory : SK (ENCOTEC) Matrix : Groundwater
Parameter Type : Field/General Chemistry Units : See Below

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Units	Well Location MW-102R	MW-103	MW-104	W-12R	MW-106	MW-113	P-19	SWW-25
Alkalinity, Total		NA	ug/L as CaCO3	530000	490000	130000	310000	330000	390000	370000	220000
Carbon Dioxide		NA	mg/L	721	524	210	465	524	398	541	319
Chloride	16887-00-6	NA	mg/L	5100	3400	600	950	1600	180	290	820
Cyanide, Free	57-12-5	1	ug/L	<10	<10	<10	<10	<10	<10	<10	<10
Cyanide, Total	57-12-5	NA	ug/L	220	50	11	15	21	<10	37	25
Dissolved Oxygen (DO)		NA	mg/L	0.23	0.35	0.76	0.49	0.71	0.26	1.21	1.25
Iron (Ferrous)	15438-31-0	NA	mg/L	<0.1	13.1	18	2.9	15.3	<0.1	3.89	11.6
Methane	74-82-8	NA	mg/L	2.23	1.43	0.357	0.712	0.887	2.95	0.405	0.153
Nitrogen, Nitrate	14797-55-8	NA	ug/L	<100	<100	<100	<100	<100	<100	<100	<100
Nitrogen, Nitrite	14797-65-0	NA	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1M	<0.1M
Nitrogen, Nitrite and Nitrate		NA	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Oxidation Reduction Potential		NA	mV	-353.5	-99.4	-91	-97.5	-99.4	-189.8	-69.8	-62.1
pH		NA	SU	8.43	6.69	6.68	6.5	6.53	7.77	6.72	6.49
Specific Conductivity		NA	uS	15.9	10.56	2.987	3.926	6.072	1.51	2.057	3.8
Sulfate	14808-79-8	NA	ug/L	260000	160000	300000	140000	430000	24000	18000	430000
Temperature		NA	degree C	9.41	14.66	10.56	12.15	12.09	11.27	14.72	12.07
Turbidity		NA	NTU	76.3	2.6	11.6	13.6	7.42	9.2	11.4	5.8

Note: NA = not available for this parameter.
Data Qualifiers: M = duplicate precision not met.

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TABLE 3-4. Summary of Shallow Zone Compliance Wells, 1st Quarter 1999

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater
Parameter Type : Metals, Total Units : ug/L

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location							
			MW-102R	MW-103	MW-104	W-12R	MW-106	MW-113	P-19	SWW-25
Aluminum	7429-90-5	NA	<200	340	3400	<200	440	360	1300	9000
Antimony	7440-36-0	4300	<60	<60	<60	<60	<60	<60	<60	<60
Arsenic	7440-38-2	0.136	32	12	<10	20	44	11	<10	<10
Barium	7440-39-3	NA	340	500	210	<200	<200	<200	<200	230
Beryllium	7440-41-7	NA	<5	<5	<5	<5	<5	<5	<5	<5
Cadmium	7440-43-9	NA	<5	<5	<5	<5	<5	<5	<5	5.8
Calcium	7440-70-2	NA	110000	140000	120000	220000	290000	120000	170000	250000
Chromium	7440-47-3	3230	<10	110	<10	<10	<10	<10	34	150
Cobalt	7440-48-4	NA	<50	<50	<50	<50	<50	<50	<50	<50
Copper	7440-50-8	NA	<25	<25	<25	<25	<25	<25	39	250
Iron	7439-89-6	NA	21000	40000	17000	13000	21000	3400	21000	42000
Lead	7439-92-1	NA	<3	25	12	3.3	4.2	18	38	49
Magnesium	7439-95-4	NA	28000	47000	23000	65000	110000	27000	38000	61000
Manganese	7439-96-5	100	1400	2400	450	390	570	930	570	700
Mercury	7439-97-6	0.146	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.61
Nickel	7440-02-0	3900	270	<40	<40	<40	<40	<40	<40	<40
Potassium	7440-09-7	NA	620000	240000	24000	40000	100000	19000	17000	52000
Selenium	7782-49-2	NA	<5	<5	<5	<5	<5	<5	<5	<5
Silver	7440-22-4	NA	<10	<10	<10	<10	<10	<10	<10	<10
Sodium	7440-23-5	NA	3100000	1900000	220000	480000	890000	110000	150000	440000
Thallium	7440-28-0	6.22	<10	<10	<10	<10	<10	<10	<10	<10
Vanadium	7440-62-2	NA	<50	<50	<50	<50	<50	<50	<50	<50
Zinc	7440-66-6	NA	<20	28	<20	<20	31	21	410	58

Note: NA = not available for this parameter
Data Qualifiers: M = Duplicate precision not met.

04-29-1999

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TABLE 3-4. Summary of Shallow Zone Compliance Wells, 1st Quarter 1999

SK Services (East), L.C.

Laboratory : SK (ENCOTEC)   Matrix : Groundwater

Parameter Type : Organics, Semi-Volatile   Units : ug/L

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location							
			MW-102R	MW-103	MW-104	W-12R	MW-106	MW-113	P-19	SWW-25
1,2,4-Trichlorobenzene	120-82-1	**113**	<100	<10	<10	<10	<10	<10	<10	<10
1,2-Dichlorobenzene	95-50-1	**16500**	<100	<10	<10	<10	<10	<10	<10	<10
1,3-Dichlorobenzene	541-73-1	**22200**	<100	<10	<10	<10	<10	<10	<10	<10
1,4-Dichlorobenzene	106-46-7	**3159**	<100	<10	<10	<10	<10	<10	<10	<10
2,4,5-Trichlorophenol	95-95-4	**9790**	<250	<25	<25	<25	<25	<25	<25	<25
2,4,6-Trichlorophenol	88-06-2	**6.53**	<100	<10	<10	<10	<10	<10	<10	<10
2,4-Dichlorophenol	120-83-2	**794**	<100	<10	<10	<10	<10	<10	<10	<10
2,4-Dimethylphenol	105-67-9	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
2,4-Dinitrophenol	51-28-5	**14000**	<250	<25	<25	<25	<25	<25	<25	<25
2,4-Dinitrotoluene	121-14-2	**9.1**	<100	<10	<10	<10	<10	<10	<10	<10
2,6-Dinitrotoluene	606-20-2	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
2-Chloronaphthalene	91-58-7	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
2-Chlorophenol	95-57-8	**402**	<100	<10	<10	<10	<10	<10	<10	<10
2-Methylnaphthalene	91-57-6	**NA**	<100	<10	<10	<10	<10	15	<10	<10
2-Methylphenol	95-48-7	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
2-Nitroaniline	88-74-4	**NA**	<250	<25	<25	<25	<25	<25	<25	<25
2-Nitrophenol	88-75-5	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
3,3'-Dichlorobenzidine	91-94-1	**0.0767**	<100	<10	<10	<10	<10	<10	<10	<10
3-Nitroaniline	99-09-2	**NA**	<250	<25	<25	<25	<25	<25	<25	<25
4,6-Dinitro-2-methylphenol	534-52-1	**765**	<250	<25	<25	<25	<25	<25	<25	<25
4-Bromophenyl phenyl ether	101-55-3	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
4-Chloro-3-Methylphenol	59-50-7	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
4-Chloroaniline	106-47-8	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
4-Chlorophenyl phenyl ether	7005-72-3	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
4-Methylphenol	106-44-5	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
4-Nitroaniline	100-01-6	**NA**	<250	<25	<25	<25	<25	<25	<25	<25
4-Nitrophenol	100-02-7	**NA**	<250	<25	<25	<25	<25	<25	<25	<25
Acenaphthene	83-32-9	**NA**	<100	<10	13	<10	<10	<10	<10	<10
Acenaphthylene	208-96-8	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
Anthracene	120-12-7	**108000**	<100	<10	<10	<10	<10	<10	<10	<10
Benzo(a)Anthracene	56-55-3	**0.031**	<100	<10	<10	<10	<10	<10	<10	<10
Benzo(a)Pyrene	50-32-8	**0.031**	<100	<10	<10	<10	<10	<10	<10	<10
Benzo(b)Fluoranthene	205-99-2	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
Benzo(g,h,i)perylene	191-24-2	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
Benzo(k)Fluoranthene	207-08-9	**0.031**	<100	<10	<10	<10	<10	<10	<10	<10

Note: NA = not available for this parameter

Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to dilution factor and may be exaggerated.

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location							
			MW-102R	MW-103	MW-104	W-12R	MW-106	MW-113	P-19	SWW-25
Bis(2-Chloroethoxy)Methane	111-91-1	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
Bis(2-Chloroethyl) Ether	111-44-4	**1.4**	<100	<10	<10	<10	<10	<10	<10	<10
Bis(2-Chloroisopropyl) Ether	108-60-1	**170000**	<100	<10	<10	<10	<10	<10	<10	<10
Bis(2-Ethylhexyl) Phthalate	117-81-7	**5.92**	<100	<10	<10	<10	<10	<10	<10	<10
Butyl Benzyl Phthalate	85-68-7	**416**	<100	<10	<10	<10	<10	<10	<10	<10
Carbazole	86-74-8	**NA**	<100	<10	<10	<10	<10	15	<10	<10
Chrysene	218-01-9	**0.031**	<100	<10	<10	<10	<10	<10	<10	<10
Di-N-Butyl phthalate	84-74-2	**15700**	<100	<10	<10	<10	<10	<10	<10	<10
Di-N-Octyl phthalate	117-84-0	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
Dibenz(a,h)anthracene	53-70-3	**0.031**	<100	<10	<10	<10	<10	<10	<10	<10
Dibenzofuran	132-64-9	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
Diethyl phthalate	84-66-2	**111000**	<100	<10	<10	<10	<10	<10	<10	<10
Dimethyl phthalate	131-11-3	**2900000**	<100	<10	<10	<10	<10	<10	<10	<10
Fluoranthene	206-44-0	**393**	<100	<10	<10	<10	<10	<10	<10	<10
Fluorene	86-73-7	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
Hexachlorobenzene	118-74-1	**0.000775**	<100	<10	<10	<10	<10	<10	<10	<10
Hexachlorobutadiene	87-68-3	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
Hexachlorocyclopentadiene	77-47-4	**17000**	<100	<10	<10	<10	<10	<10	<10	<10
Hexachloroethane	67-72-1	**12.4**	<100	<10	<10	<10	<10	<10	<10	<10
Indeno(1,2,3-c,d)pyrene	193-39-5	**0.031**	<100	<10	<10	<10	<10	<10	<10	<10
Isophorone	78-59-1	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
N-Nitroso-di-N-propylamine	621-64-7	**NA**	<100	<10	<10	<10	<10	<10	<10	<10
N-Nitrosodiphenylamine	86-30-6	**16.2**	<100	<10	<10	<10	<10	<10	<10	<10
Naphthalene	91-20-3	**NA**	<100	<10	<10	<10	<10	26	<10	<10
Nitrobenzene	98-95-3	**1900**	<100	<10	<10	<10	<10	<10	<10	<10
Pentachlorophenol	87-86-5	**8.2**	<250	<25	<25	<25	<25	<25	<25	<25
Phenanthrene	85-01-8	**NA**	<100	<10	<10	<10	<10	15	<10	<10
Phenol	108-95-2	**4600000**	1300	<10	<10	<10	<10	<10	<10	<10
Pyrene	129-00-0	**8970**	<100	<10	<10	<10	<10	<10	<10	<10

Note: NA = not available for this parameter

Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to dilution factor and may be exaggerated.

safety-kleen.

TABLE 3-4. Summary of Shallow Zone Compliance Wells, 1st Quarter 1999

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater

Parameter Type : Organic, Volatile Units : ug/L

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location MW-102R	MW-103	MW-104	W-12R	MW-106	MW-113	P-19	SWW-25
1,1,1-Trichloroethane	71-55-6	NA	<10	<10	<10	<10	<10	<10	<10	<10
1,1,2,2-Tetrachloroethane	79-34-5	NA	<10	<10	<10	<10	<10	<10	<10	<10
1,1,2-Trichloroethane	79-00-5	NA	<10	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethane	75-34-3	NA	<10	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	75-35-4	NA	<10	<10	<10	<10	<10	<10	<10	<10
1,2-Dichloroethane	107-06-2	99	<10	<10	<10	<10	<10	<10	<10	<10
1,2-Dichloropropane	78-87-5	NA	<10	<10	<10	<10	<10	<10	<10	<10
2-Butanone (MEK)	78-93-3	NA	84	<10	<10	<10	<10	<10	<10	<10
2-Hexanone	591-78-6	NA	<10	<10	<10	<10	<10	<10	<10	<10
4-Methyl-2-Pentanone (MIBK)	108-10-1	NA	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	67-64-1	NA	260	<10	<10	<10	<10	<10	<10	<10
Benzene	71-43-2	71	<10	<10	10	<10	<10	<10	<10	<10
Bromodichloromethane	75-27-4	22	<10	<10	<10	<10	<10	<10	<10	<10
Bromoform	75-25-2	360	<10	<10	<10	<10	<10	<10	<10	<10
Bromomethane	74-83-9	NA	<10	<10	<10	<10	<10	<10	<10	<10
Carbon Disulfide	75-15-0	NA	<10	<10	<10	<10	<10	<10	<10	<10
Carbon tetrachloride	56-23-5	6.31	<10	<10	<10	<10	<10	<10	<10	<10
Chlorobenzene	108-90-7	21000	<10	<10	<10	<10	<10	<10	<10	<10
Chloroethane	75-00-3	NA	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	67-66-3	470	<10	<10	<10	<10	<10	<10	<10	<10
Chloromethane	74-87-3	NA	<10	<10	<10	<10	<10	<10	<10	<10
cis-1,3-Dichloropropene	10061-01-5	NA	<10	<10	<10	<10	<10	<10	<10	<10
Dibromochloromethane	124-48-1	NA	<10	<10	<10	<10	<10	<10	<10	<10
Ethylbenzene	100-41-4	27900	<10	<10	26	<10	<10	<10	<10	<10
Methylene chloride	75-09-2	1600	<10	<10	<10	<10	<10	<10	<10	<10
Styrene	100-42-5	NA	<10	<10	<10	<10	<10	<10	<10	<10
Tetrachloroethene	127-18-4	4.29	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	108-88-3	200000	<10	<10	<10	<10	<10	<10	<10	<10
total 1,2-Dichloroethene	540-59-0	NA	<10	<10	<10	<10	<10	<10	<10	<10
Total Xylenes	1330-20-7	NA	<10	<10	<10	<10	<10	<10	<10	<10
trans-1,3-Dichloropropene	10061-02-6	NA	<10	<10	<10	<10	<10	<10	<10	<10
Trichloroethene	79-01-6	81	<10	<10	<10	<10	<10	<10	<10	<10
Vinyl chloride	75-01-4	525	<10	<10	<10	<10	<10	<10	<10	<10

Note: NA = not available for this parameter

Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to dilution factor and may be exaggerated.

SK Services (East), L.C.

safety-kleen.

TABLE 3-5. Summary of Shallow Zone Monitoring Wells, 1st Quarter 1999

Laboratory : SK (ENCOTEC) Matrix : Groundwater

Parameter Type : Field/General Chemistry Units : See Below

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Units	Well Location								
				MW-108	MW-109	MW-110	MW-112	MW-116	MW-117	MW-118	MW-119	MW-120
Alkalinity, Total		NA	ug/L as CaCO3	1400000	120000	600000	180000	200000	460000	690000	280000	390000
Carbon Dioxide		NA	mg/L	1220	248	560	329	360	452	770	266	395
Chloride	16887-00-6	NA	mg/L	1300	210	2700	1400	450	840	380	1400	4100
Cyanide, Free	57-12-5	1	ug/L	<10	<10	<10	<10	<10	12	<10	<10	<10
Cyanide, Total	57-12-5	NA	ug/L	13	<10	82	160	26	98	46	42	47
Dissolved Oxygen (DO)		NA	mg/L	0.2	0.67	0.31	3.96	1.02	0.46	1.23	0.19	1.27
Iron (Ferrous)	15438-31-0	NA	mg/L	<51	18.9	24.1	70.8	47.5	9.91	<0.1	<0.1	10.7
Methane	74-82-8	NA	mg/L	11.9	2.79	5.32	0.837	8.08	9.01	8.29	0.191	1.62
Nitrogen, Nitrate	14797-55-8	NA	ug/L	<1000	<100	<100	<100	<100	<100	<100	<100	13000
Nitrogen, Nitrite	14797-65-0	NA	mg/L	<1M	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.18
Nitrogen, Nitrite and Nitrate		NA	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	13
Oxidation Reduction Potential		NA	mV	-331.5	13.7	-153.4	-37.3	-49.5	-102.5	-60.9	-144.4	-67.8
pH		NA	SU	8.51	6.01	6.69	6.34	6.5	6.95	6.32	7.65	6.26
Specific Conductivity		NA	uS	6.047	1.027	8.45	6.187	2.5	3.559	3.601	5.027	15.6
Sulfate	14808-79-8	NA	ug/L	170000	22000	18000	670000	50000	45000	18000	310000	780000
Temperature		NA	degree C	10.71	8.09	11.37	10.85	8.55	12.53	7.63	6.82	12.26
Turbidity		NA	NTU	411.1	0.9	26.8	22.7	58.5	2.1	20.9	17.4	9.4

Note: NA = not available for this parameter.

Data Qualifiers: M = duplicate precision not met.

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TABLE 3-5. Summary of Shallow Zone Monitoring Wells, 1st Quarter 1999

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater

Parameter Type : Field/General Chemistry Units : See Below

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Units	Well Location								
				MW-121	MW-122	MW-123	MW-124	MW-129	MW-130	P-24	P-25A	MW-105
Alkalinity, Total		NA	ug/L as CaCO3	84000	790000	200000	710000	320000	260000	500000	150000	230000
Carbon Dioxide		NA	mg/L	123	235	225	679	435	383	513	174	424
Chloride	16887-00-6	NA	mg/L	1200	2500	1800	660	200	1300	570	66	2100
Cyanide, Free	57-12-5	1	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	19
Cyanide, Total	57-12-5	NA	ug/L	<10	<10	<10	110	57	45	560	12	23
Dissolved Oxygen (DO)		NA	mg/L	0.18	0.63	0.31	0.41	0.83	1.37	3.4	0.8	0.78
Iron (Ferrous)	15438-31-0	NA	mg/L	9.31	66.8	14	0.89	16.2	74.5	0.401	1.98	16.3
Methane	74-82-8	NA	mg/L	0.246	0.084	0.064	8.3	4.82	4.36	3.13	0.125	0.534
Nitrogen, Nitrate	14797-55-8	NA	ug/L	<100	<100	<100	<100	<100	<100	<100	<100	<100
Nitrogen, Nitrite	14797-65-0	NA	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Nitrite and Nitrate		NA	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Oxidation Reduction Potential		NA	mV	57.4	-43.6	-72.3	-152.7	-197.9	-87.4	-287.1	-12.9	-110.3
pH		NA	SU	5.84	6.34	6.92	6.85	6.81	6.56	6.91	6.69	6.4
Specific Conductivity		NA	uS	3.786	7.823	5.227	3.245	1.434	4.723	3.086	0.777	6.765
Sulfate	14808-79-8	NA	ug/L	200000	310000	190000	35000	11000	18000	170000	46000	330000
Temperature		NA	degree C	8.53	11.28	7.97	12.95	15.84	13.32	17.75	9.59	12.03
Turbidity		NA	NTU	3.8	0.5	2.2	8.6	0.7	56.1	114	0.6	6.2

Note: NA = not available for this parameter.

Data Qualifiers: M = duplicate precision not met.

SK Services (East), L.C.

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TABLE 3-5. Summary of Shallow Zone Monitoring Wells, 1st Quarter 1999

Laboratory : SK (ENCOTEC) Matrix : Groundwater

Parameter Type : Metals, Total Units : ug/L

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location								
			MW-108	MW-109	MW-110	MW-112	MW-116	MW-117	MW-118	MW-119	MW-120
Aluminum	7429-90-5	NA	2000	<200	<200	<200	<200	<200	260	<200	240
Antimony	7440-36-0	4300	<60	<60	<60	<60	<60	<60	<60	<60	<60
Arsenic	7440-38-2	0.136	<10	<10	12	12	<10	<10	10	20	26
Barium	7440-39-3	NA	<200	<200	1200	220	480	640	490	<200	<200
Beryllium	7440-41-7	NA	<5	<5	<5	<5	<5	<5	<5	<5	<5
Cadmium	7440-43-9	NA	<5	<5	<5	<5	<5	<5	<5	<5	<5
Calcium	7440-70-2	NA	<5000	45000	140000	81000	84000	170000	90000	130000	160000
Chromium	7440-47-3	3230	540	<10	<10	20	<10	<10	<10	270	470
Cobalt	7440-48-4	NA	<50	<50	<50	<50	<50	<50	<50	<50	<50
Copper	7440-50-8	NA	<25	<25	<25	<25	<25	<25	<25	<25	<25
Iron	7439-89-6	NA	240	17000	47000	99000	63000	20000	44000	2400	12000
Lead	7439-92-1	NA	<3	<3	<3	<3	<3	<3	9.9	<3	<3
Magnesium	7439-95-4	NA	15000	19000	110000	25000	37000	56000	64000	95000	330000
Manganese	7439-96-5	100	29	1900	690	2400	1300	520	3500	94	350
Mercury	7439-97-6	0.146	0.49	0.45	0.32	<0.2	<0.2	<0.2	<0.2	0.46	0.4
Nickel	7440-02-0	3900	<40	<40	<40	<40	<40	<40	<40	<40	<40
Potassium	7440-09-7	NA	32000	5200	120000	150000	14000	35000	23000	81000	110000
Selenium	7782-49-2	NA	<5	<5	<5	<5	<5	<5	<5	<5	<5
Silver	7440-22-4	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
Sodium	7440-23-5	NA	1400000	120000	1500000	1100000	270000	480000	470000	880000	2400000
Thallium	7440-28-0	6.22	<10	<10	<10	<10	<10	<10	<10	<10	<10
Vanadium	7440-62-2	NA	290	<50	<50	<50	<50	<50	<50	<50	<50
Zinc	7440-66-6	NA	20	<20	70	<20	1800	<20	<20	<20	<20

Note: NA = not available for this parameter

Data Qualifiers: M = deplicate precision not met.

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TABLE 3-5. Summary of Shallow Zone Monitoring Wells, 1st Quarter 1999

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater
Parameter Type : Metals, Total Units : ug/L

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location MW-121	MW-122	MW-123	MW-124	MW-129	MW-130	P-24	P-25A	MW-105
Aluminum	7429-90-5	NA	<200	<200	<200	<200	<200	910	430	<200	210
Antimony	7440-36-0	4300	<60	<60	<60	<60	<60	<60	<60	<60	<60
Arsenic	7440-38-2	0.136	17	15	<10	<10	<10	<10	<10	<10	91
Barium	7440-39-3	NA	<200	<200	<200	<200	<200	960	<200	<200	<200
Beryllium	7440-41-7	NA	<5	<5	<5	<5	<5	<5	<5	<5	<5
Cadmium	7440-43-9	NA	<5	<5	<5	<5	<5	<5	<5	<5	<5
Calcium	7440-70-2	NA	69000	120000	100000	190000	130000	130000	270000	55000	240000
Chromium	7440-47-3	3230	400	34	<10	<10	<10	24	25	<10	160
Cobalt	7440-48-4	NA	<50	<50	<50	<50	<50	<50	<50	<50	<50
Copper	7440-50-8	NA	<25	<25	<25	<25	<25	<25	<25	<25	<25
Iron	7439-89-6	NA	12000	70000	19000	10000	19000	100000	1200	3800	21000
Lead	7439-92-1	NA	<3	<3	<3	11	<3	23	34	<3	<3
Magnesium	7439-95-4	NA	81000	120000	73000	61000	23000	57000	70000	24000	55000
Manganese	7439-96-5	100	400	2300	490	360	770	1100	1100	480	950
Mercury	7439-97-6	0.146	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	0.3	<0.2	<0.2
Nickel	7440-02-0	3900	<40	<40	<40	<40	<40	<40	<40	<40	<40
Potassium	7440-09-7	NA	57000	130000	100000	25000	16000	42000	17000	5700	170000
Selenium	7782-49-2	NA	<5	<5	<5	<5	<5	<5	<5	<5	<5
Silver	7440-22-4	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
Sodium	7440-23-5	NA	700000	1300000	1100000	280000	98000	700000	300000	42000	1200000
Thallium	7440-28-0	6.22	<10	<10	<10	<10	<10	<10	<10	<10	<10
Vanadium	7440-62-2	NA	<50	<50	<50	<50	<50	<50	<50	<50	<50
Zinc	7440-66-6	NA	<20	44	<20	<20	<20	<20	300	<20	25

Note: NA = not available for this parameter
Data Qualifiers: M = duplicate prescision not met.

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TABLE 3-5. Summary of Shallow Zone Monitoring Wells, 1st Quarter 1999

SK Services (East), L.C.

Laboratory : SK (ENCOTEC)   Matrix : Groundwater
Parameter Type : Organic, Semi-Volatile   Units : ug/L

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location								
			MW-108	MW-109	MW-110	MW-112	MW-116	MW-117	MW-118	MW-119	MW-120
1,2,4-Trichlorobenzene	120-82-1	**113**	<100	<10	<10	<10	<20	<10	<10	<10	<10
1,2-Dichlorobenzene	95-50-1	**16500**	<100	<10	<10	<10	<20	<10	<10	<10	<10
1,3-Dichlorobenzene	541-73-1	**22200**	<100	<10	<10	<10	<20	<10	<10	<10	<10
1,4-Dichlorobenzene	106-46-7	**3159**	310	12	<10	<10	<20	<10	<10	<10	<10
2,4,5-Trichlorophenol	95-95-4	**9790**	<250	<25	<25	<25	<50	<25	<25	<25	<25
2,4,6-Trichlorophenol	88-06-2	**6.53**	<100	<10	<10	<10	<20	<10	<10	<10	<10
2,4-Dichlorophenol	120-83-2	**794**	<100	<10	<10	<10	<20	<10	<10	<10	<10
2,4-Dimethylphenol	105-67-9	**NA**	180	<10	<10	<10	<20	<10	<10	<10	<10
2,4-Dinitrophenol	51-28-5	**14000**	<250	<25	<25	<25	<50	<25	<25	<25	<25
2,4-Dinitrotoluene	121-14-2	**9.1**	<100	<10	<10	<10	<20	<10	<10	<10	<10
2,6-Dinitrotoluene	606-20-2	**NA**	<100	<10	<10	<10	<20	<10	<10	<10	<10
2-Chloronaphthalene	91-58-7	**NA**	<100	<10	<10	<10	<20	<10	<10	<10	<10
2-Chlorophenol	95-57-8	**402**	<100	<10	<10	<10	<20	<10	<10	<10	<10
2-Methylnaphthalene	91-57-6	**NA**	<100	<10	<10	<10	<20	<10	<10	12	<10
2-Methylphenol	95-48-7	**NA**	200	<10	<10	<10	<20	<10	<10	<10	<10
2-Nitroaniline	88-74-4	**NA**	<250	<25	<25	<25	<50	<25	<25	<25	<25
2-Nitrophenol	88-75-5	**NA**	<100	<10	<10	<10	<20	<10	<10	<10	<10
3,3'-Dichlorobenzidine	91-94-1	**0.0767**	<100	<10	<10	<10	<20	<10	<10	<10	<10
3-Nitroaniline	99-09-2	**NA**	<250	<25	<25	<25	<50	<25	<25	<25	<25
4,6-Dinitro-2-methylphenol	534-52-1	**765**	<250	<25	<25	<25	<50	<25	<25	<25	<25
4-Bromophenyl phenyl ether	101-55-3	**NA**	<100	<10	<10	<10	<20	<10	<10	<10	<10
4-Chloro-3-Methylphenol	59-50-7	**NA**	<100	<10	<10	<10	<20	<10	<10	<10	<10
4-Chloroaniline	106-47-8	**NA**	<100	<10	<10	<10	<20	<10	<10	<10	<10
4-Chlorophenyl phenyl ether	7005-72-3	**NA**	<100	<10	<10	<10	<20	<10	<10	<10	<10
4-Methylphenol	106-44-5	**NA**	<100	<10	<10	<10	<20	<10	<10	<10	<10
4-Nitroaniline	100-01-6	**NA**	<250	<25	<25	<25	<50	<25	<25	<25	<25
4-Nitrophenol	100-02-7	**NA**	<250	<25	<25	<25	<50	<25	<25	<25	<25
Acenaphthene	83-32-9	**NA**	<100	<10	38	<10	96	<10	<10	12	<10
Acenaphthylene	208-96-8	**NA**	<100	<10	<10	<10	<20	<10	<10	12	<10
Anthracene	120-12-7	**108000**	<100	<10	<10	<10	<20	<10	<10	<10	<10
Benzo(a)Anthracene	56-55-3	**0.031**	<100	<10	<10	<10	<20	<10	<10	<10	<10
Benzo(a)Pyrene	50-32-8	**0.031**	<100	<10	<10	<10	<20	<10	<10	<10	<10
Benzo(b)Fluoranthene	205-99-2	**NA**	<100	<10	<10	<10	<20	<10	<10	<10	<10
Benzo(g,h,i)perylene	191-24-2	**NA**	<100	<10	<10	<10	<20	<10	<10	<10	<10
Benzo(k)Fluoranthene	207-08-9	**0.031**	<100	<10	<10	<10	<20	<10	<10	<10	<10

Note: NA = not available for this parameter
Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to dilution factor and may be exaggerated.

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location MW-108	MW-109	MW-110	MW-112	MW-116	MW-117	MW-118	MW-119	MW-120
Bis(2-Chloroethoxy)Methane	111-91-1	NA	<100	<10	<10	<10	<20	<10	<10	<10	<10
Bis(2-Chloroethyl) Ether	111-44-4	1.4	<100	<10	<10	<10	<20	<10	<10	<10	<10
Bis(2-Chloroisopropyl) Ether	108-60-1	170000	<100	<10	<10	<10	<20	<10	<10	<10	<10
Bis(2-Ethylhexyl) Phthalate	117-81-7	5.92	<100	<10	<10	<10	<20	<10	<10	<10	<10
Butyl Benzyl Phthalate	85-68-7	416	<100	<10	<10	<10	<20	<10	<10	<10	<10
Carbazole	86-74-8	NA	<100	<10	<10	<10	180	<10	<10	23	<10
Chrysene	218-01-9	0.031	<100	<10	<10	<10	<20	<10	<10	<10	<10
Di-N-Butyl phthalate	84-74-2	15700	<100	<10	<10	<10	<20	<10	<10	<10	<10
Di-N-Octyl phthalate	117-84-0	NA	<100	<10	<10	<10	<20	<10	<10	<10	<10
Dibenz(a,h)anthracene	53-70-3	0.031	<100	<10	<10	<10	<20	<10	<10	<10	<10
Dibenzofuran	132-64-9	NA	<100	<10	<10	<10	<20	<10	<10	17	<10
Diethyl phthalate	84-66-2	111000	<100	<10	<10	<10	<20	<10	<10	<10	<10
Dimethyl phthalate	131-11-3	2900000	<100	<10	<10	<10	<20	<10	<10	<10	<10
Fluoranthene	206-44-0	393	<100	<10	<10	<10	<20	<10	<10	13	<10
Fluorene	86-73-7	NA	<100	<10	<10	<10	52	<10	<10	18	<10
Hexachlorobenzene	118-74-1	0.000775	<100	<10	<10	<10	<20	<10	<10	<10	<10
Hexachlorobutadiene	87-68-3	NA	<100	<10	<10	<10	<20	<10	<10	<10	<10
Hexachlorocyclopentadiene	77-47-4	17000	<100	<10	<10	<10	<20	<10	<10	<10	<10
Hexachloroethane	67-72-1	12.4	<100	<10	<10	<10	<20	<10	<10	<10	<10
Indeno(1,2,3-c,d)pyrene	193-39-5	0.031	<100	<10	<10	<10	<20	<10	<10	<10	<10
Isophorone	78-59-1	NA	<100	<10	<10	<10	<20	<10	<10	<10	<10
N-Nitroso-di-N-propylamine	621-64-7	NA	<100	<10	<10	<10	<20	<10	<10	<10	<10
N-Nitrosodiphenylamine	86-30-6	16.2	<100	<10	<10	<10	<20	<10	<10	<10	<10
Naphthalene	91-20-3	NA	1500	<10	<10	<10	<20	<10	<10	<10	<10
Nitrobenzene	98-95-3	1900	<100	<10	<10	<10	<20	<10	<10	<10	<10
Pentachlorophenol	87-86-5	8.2	<250	<25	<25	<25	<50	<25	<25	<25	<25
Phenanthrene	85-01-8	NA	<100	<10	<10	<10	38	<10	13	38	<10
Phenol	108-95-2	4600000	<100	<10	<10	<10	<20	<10	<10	<10	<10
Pyrene	129-00-0	8970	<100	<10	<10	<10	<20	<10	<10	11	<10

Note: NA = not available for this parameter

Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to dilution factor and may be exaggerated

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TABLE 3-5. Summary of Shallow Zone Monitoring Wells, 1st Quarter 1999

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater

Parameter Type : Volatile, Semi-volatile Units : ug/L

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location MW-121	MW-122	MW-123	MW-124	MW-129	MW-130	P-24	P-25A	MW-102
1,2,4-Trichlorobenzene	120-82-1	113	<20	<10	<10	<500	<10	<10	<10	<10	<10
1,2-Dichlorobenzene	95-50-1	16500	<20	<10	<10	<500	<10	<10	<10	<10	<10
1,3-Dichlorobenzene	541-73-1	22200	<20	<10	<10	<500	<10	<10	<10	<10	<10
1,4-Dichlorobenzene	106-46-7	3159	<20	<10	<10	<500	<10	<10	<10	<10	<10
2,4,5-Trichlorophenol	95-95-4	9790	<50	<25	<25	<1200	<25	<25	<25	<25	<25
2,4,6-Trichlorophenol	88-06-2	6.53	<20	<10	<10	<500	<10	<10	<10	<10	<10
2,4-Dichlorophenol	120-83-2	794	<20	<10	<10	<500	<10	<10	<10	<10	<10
2,4-Dimethylphenol	105-67-9	NA	<20	<10	<10	4400	<10	<10	<10	<10	<10
2,4-Dinitrophenol	51-28-5	14000	<50	<25	<25	<1200	<25	<25	<25	<25	<25
2,4-Dinitrotoluene	121-14-2	9.1	<20	<10	<10	<500	<10	<10	<10	<10	<10
2,6-Dinitrotoluene	606-20-2	NA	<20	<10	<10	<500	<10	<10	<10	<10	<10
2-Chloronaphthalene	91-58-7	NA	<20	<10	<10	<500	<10	<10	<10	<10	<10
2-Chlorophenol	95-57-8	402	<20	<10	<10	<500	<10	<10	<10	<10	<10
2-Methylnaphthalene	91-57-6	NA	<20	<10	<10	<500	<10	<10	<10	<10	<10
2-Methylphenol	95-48-7	NA	<20	<10	<10	3000	<10	<10	<10	<10	<10
2-Nitroaniline	88-74-4	NA	<50	<25	<25	<1200	<25	<25	<25	<25	<25
2-Nitrophenol	88-75-5	NA	<20	<10	<10	<500	<10	<10	<10	<10	<10
3,3'-Dichlorobenzidine	91-94-1	0.0767	<20	<10	<10	<500	<10	<10	<10	<10	<10
3-Nitroaniline	99-09-2	NA	<50	<25	<25	<1200	<25	<25	<25	<25	<25
4,6-Dinitro-2-methylphenol	534-52-1	765	<50	<25	<25	<1200	<25	<25	<25	<25	<25
4-Bromophenyl phenyl ether	101-55-3	NA	<20	<10	<10	<500	<10	<10	<10	<10	<10
4-Chloro-3-Methylphenol	59-50-7	NA	<20	<10	<10	<500	<10	<10	<10	<10	<10
4-Chloroaniline	106-47-8	NA	<20	<10	<10	<500	<10	<10	<10	<10	<10
4-Chlorophenyl phenyl ether	7005-72-3	NA	<20	<10	<10	<500	<10	<10	<10	<10	<10
4-Methylphenol	106-44-5	NA	<20	<10	<10	640	<10	<10	<10	<10	<10
4-Nitroaniline	100-01-6	NA	<50	<25	<25	<1200	<25	<25	<25	<25	<25
4-Nitrophenol	100-02-7	NA	<50	<25	<25	<1200	<25	<25	<25	<25	<25
Acenaphthene	83-32-9	NA	<20	<10	<10	<500	<10	11	86	<10	<10
Acenaphthylene	208-96-8	NA	<20	<10	<10	<500	<10	<10	<10	<10	<10
Anthracene	120-12-7	108000	<20	<10	<10	<500	<10	<10	<10	<10	<10
Benzo(a)Anthracene	56-55-3	0.031	<20	<10	<10	<500	<10	<10	<10	<10	<10
Benzo(a)Pyrene	50-32-8	0.031	<20	<10	<10	<500	<10	<10	<10	<10	<10
Benzo(b)Fluoranthene	205-99-2	NA	<20	<10	<10	<500	<10	<10	<10	<10	<10
Benzo(g,h,i)perylene	191-24-2	NA	<20	<10	<10	<500	<10	<10	<10	<10	<10
Benzo(k)Fluoranthene	207-08-9	0.031	<20	<10	<10	<500	<10	<10	<10	<10	<10

Note: NA = not available for this parameter

Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to dilution factor and may be exaggerated.

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location								
			MW-121	MW-122	MW-123	MW-124	MW-129	MW-130	P-24	P-25A	MW-102
Bis(2-Chloroethoxy)Methane	111-91-1	**NA**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Bis(2-Chloroethyl) Ether	111-44-4	**1.4**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Bis(2-Chloroisopropyl) Ether	108-60-1	**170000**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Bis(2-Ethylhexyl) Phthalate	117-81-7	**5.92**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Butyl Benzyl Phthalate	85-68-7	**416**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Carbazole	86-74-8	**NA**	<20	<10	<10	<500	<10	<10	12	<10	<10
Chrysene	218-01-9	**0.031**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Di-N-Butyl phthalate	84-74-2	**15700**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Di-N-Octyl phthalate	117-84-0	**NA**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Dibenz(a,h)anthracene	53-70-3	**0.031**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Dibenzofuran	132-64-9	**NA**	<20	<10	<10	<500	<10	<10	50	<10	<10
Diethyl phthalate	84-66-2	**111000**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Dimethyl phthalate	131-11-3	**2900000**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Fluoranthene	206-44-0	**393**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Fluorene	86-73-7	**NA**	<20	<10	<10	<500	<10	<10	25	<10	<10
Hexachlorobenzene	118-74-1	**0.000775**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Hexachlorobutadiene	87-68-3	**NA**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Hexachlorocyclopentadiene	77-47-4	**17000**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Hexachloroethane	67-72-1	**12.4**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Indeno(1,2,3-c,d)pyrene	193-39-5	**0.031**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Isophorone	78-59-1	**NA**	<20	<10	<10	<500	<10	<10	<10	<10	<10
N-Nitroso-di-N-propylamine	621-64-7	**NA**	<20	<10	<10	<500	<10	<10	<10	<10	<10
N-Nitrosodiphenylamine	86-30-6	**16.2**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Naphthalene	91-20-3	**NA**	270	<10	<10	7000	15	<10	130	<10	13
Nitrobenzene	98-95-3	**1900**	<20	<10	<10	<500	<10	<10	<10	<10	<10
Pentachlorophenol	87-86-5	**8.2**	<50	<25	<25	<1200	<25	<25	<25	<25	<25
Phenanthrene	85-01-8	**NA**	<20	<10	<10	<500	<10	<10	14	<10	<10
Phenol	108-95-2	**4600000**	<20	<10	<10	710	<10	<10	<10	<10	<10
Pyrene	129-00-0	**8970**	<20	<10	<10	<500	<10	<10	<10	<10	<10

Note: NA = not available for this parameter
Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to dilution factor and may be exaggerated.

TABLE 3-5. Summary of Shallow Zone Monitoring Wells, 1st Quarter 1999

safety-kleen. SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater
Parameter Type : Organic, Volatile Units : ug/L

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location MW-108	MW-109	MW-110	MW-112	MW-116	MW-117	MW-118	MW-119	MW-120
1,1,1-Trichloroethane	71-55-6	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
1,1,2,2-Tetrachloroethane	79-34-5	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
1,1,2-Trichloroethane	79-00-5	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethane	75-34-3	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	75-35-4	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
1,2-Dichloroethane	107-06-2	99	<10	<10	<10	<10	<10	<10	<10	<10	<10
1,2-Dichloropropane	78-87-5	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
2-Butanone (MEK)	78-93-3	NA	<20	<10	<10	<10	<10	<10	<10	<10	<10
2-Hexanone	591-78-6	NA	<20	<10	<10	<10	<10	<10	<10	<10	<10
4-Methyl-2-Pentanone (MIBK)	108-10-1	NA	<20	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	67-64-1	NA	<20	<10	<10	<10	26	<10	<10	<10	<10
Benzene	71-43-2	71	95	10	<10	<10	<10	<10	<10	<10	<10
Bromodichloromethane	75-27-4	22	<10	<10	<10	<10	<10	<10	<10	<10	<10
Bromoform	75-25-2	360	<10	<10	<10	<10	<10	<10	<10	<10	<10
Bromomethane	74-83-9	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
Carbon Disulfide	75-15-0	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
Carbon tetrachloride	56-23-5	6.31	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chlorobenzene	108-90-7	21000	210	190	<10	<10	<10	<10	<10	<10	<10
Chloroethane	75-00-3	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	67-66-3	470	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloromethane	74-87-3	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
cis-1,3-Dichloropropene	10061-01-5	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
Dibromochloromethane	124-48-1	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
Ethylbenzene	100-41-4	27900	<10	<10	<10	<10	<10	<10	<10	<10	<10
Methylene chloride	75-09-2	1600	<10	<10	<10	<10	<10	<10	<10	<10	<10
Styrene	100-42-5	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
Tetrachloroethene	127-18-4	4.29	<10	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	108-88-3	200000	17	<10	<10	<10	<10	<10	<10	<10	<10
total 1,2-Dichloroethene	540-59-0	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
Total Xylenes	1330-20-7	NA	36	<10	<10	<10	<10	<10	<10	<10	<10
trans-1,3-Dichloropropene	10061-02-6	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10
Trichloroethene	79-01-6	81	<10	<10	<10	<10	<10	<10	<10	<10	<10
Vinyl chloride	75-01-4	525	<10	<10	<10	<10	<10	<10	<10	<10	<10

Note: NA = not available for this parameter
Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to dilution factor and may be exaggerated.

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TABLE 3-5. Summary of Shallow Zone Monitoring Wells, 1st Quarter 1999

SK Services (East), L.C.

Laboratory : *SK (ENCOTEC)* *Matrix* : *Groundwater*

Parameter Type : Organic, Volatile Units : ug/L

Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	Well Location								
			MW-121	MW-122	MW-123	MW-124	MW-129	MW-130	P-24	P-25A	MW-105
1,1,1-Trichloroethane	71-55-6	NA	<10	<10	<10	<62M	<10	<10	<10	<10	<10
1,1,2,2-Tetrachloroethane	79-34-5	NA	<10	<10	<10	<62M	<10	<10	<10	<10	<10
1,1,2-Trichloroethane	79-00-5	NA	<10	<10	<10	<62M	<10	<10	<10	<10	<10
1,1-Dichloroethane	75-34-3	NA	<10	<10	<10	<62M	<10	<10	<10	<10	<10
1,1-Dichloroethene	75-35-4	NA	<10	<10	<10	<62M	<10	<10	<10	<10	<10
1,2-Dichloroethane	107-06-2	99	<10	<10	<10	<62M	<10	<10	<10	<10	<10
1,2-Dichloropropane	78-87-5	NA	<10	<10	<10	<62M	<10	<10	<10	<10	<10
2-Butanone (MEK)	78-93-3	NA	<10	<10	<10	<120M	<10	<10	<10	<10	<10
2-Hexanone	591-78-6	NA	<10	<10	<10	<120M	<10	<10	<10	<10	<10
4-Methyl-2-Pentanone (MIBK)	108-10-1	NA	<10	<10	<10	<120M	<10	<10	<10	<10	<10
Acetone	67-64-1	NA	<10	<10	<10	<120M	<10	<10	<10	<10	38
Benzene	71-43-2	71	<10	<10	<10	<62M	<10	<10	160	<10	<10
Bromodichloromethane	75-27-4	22	<10	<10	<10	<62M	<10	<10	<10	<10	<10
Bromoform	75-25-2	360	<10	<10	<10	<62M	<10	<10	<10	<10	<10
Bromomethane	74-83-9	NA	<10	<10	<10	<62M	<10	<10	<10	<10	<10
Carbon Disulfide	75-15-0	NA	<10	<10	<10	<62M	<10	<10	<10	<10	<10
Carbon tetrachloride	56-23-5	6.31	<10	<10	<10	<62M	<10	<10	<10	<10	<10
Chlorobenzene	108-90-7	21000	<10	<10	<10	<62M	<10	<10	<10	<10	<10
Chloroethane	75-00-3	NA	<10	<10	<10	<62M	<10	<10	<10	<10	<10
Chloroform	67-66-3	470	<10	<10	<10	<62M	<10	<10	<10	<10	<10
Chloromethane	74-87-3	NA	<10	<10	<10	<62M	<10	<10	<10	<10	<10
cis-1,3-Dichloropropene	10061-01-5	NA	<10	<10	<10	<62M	<10	<10	<10	<10	<10
Dibromochloromethane	124-48-1	NA	<10	<10	<10	<62M	<10	<10	<10	<10	<10
Ethylbenzene	100-41-4	27900	<10	<10	<10	<62M	<10	<10	120	<10	<10
Methylene chloride	75-09-2	1600	<10	<10	<10	<62M	<10	<10	<10	<10	<10
Styrene	100-42-5	NA	<10	<10	<10	<62M	<10	<10	<10	<10	<10
Tetrachloroethene	127-18-4	4.29	<10	<10	<10	<62M	<10	<10	<10	<10	<10
Toluene	108-88-3	200000	<10	<10	<10	<62M	<10	<10	<10	<10	<10
total 1,2-Dichloroethene	*540-59-0*	NA	<10	<10	<10	<62M	<10	<10	<10	<10	<10
Total Xylenes	1330-20-7	NA	<10	<10	<10	<62M	<10	<10	24	<10	<10
trans-1,3-Dichloropropene	10061-02-6	NA	<10	<10	<10	<62M	<10	<10	<10	<10	<10
Trichloroethene	79-01-6	81	<10	<10	<10	<62M	<10	<10	<10	<10	<10
Vinyl chloride	75-01-4	525	<10	<10	<10	<62M	<10	<10	<10	<10	<10

Note: NA = not available for this parameter

Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to dilution factor and may be exaggerated.

Table 3-6. Comparison of Detected Parameters For Shallow Zone Compliance Well MW-102R

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			2,590.00	230.00
	Oxidation Reduction Pot		NA			-120.00	-353.50
	pH		NA			7.09	8.43
	Specific Conductivity		NA			9.00	15.90
	Temperature		NA			15.20	9.41
	Turbidity		NA			1,083.00	76.30
General Chemistry							
	Alkalinity, Total		NA			760,000.00	530,000.00
	Carbon Dioxide		NA			849,000.00	721,000.00
	Chloride	16887-00-6	NA			2,400,000.00	5,100,000.00
	Cyanide, Total	57-12-5	NA			390.00	220.00
	Iron (Ferrous)	15438-31-0	NA			16,500.00	
	Methane	74-82-8	NA			3,990.00	2,230.00
	Sulfate	14808-79-8	NA			52,000.00	260,000.00
Metals, Total							
	Arsenic	7440-38-2	**0.136**			27.00	32.00
	Barium	7440-39-3	NA			300.00	340.00
	Cadmium	7440-43-9	NA			5.00	
	Calcium	7440-70-2	NA			97,000.00	110,000.00
	Chromium	7440-47-3	**3,230.0**			14.00	
	Copper	7440-50-8	NA			130.00	
	Iron	7439-89-6	NA			43,000.00	21,000.00
	Lead	7439-92-1	NA			4.10	
	Magnesium	7439-95-4	NA			35,000.00	28,000.00
	Manganese	7439-96-5	**100.0**			1,400.00	1,400.00
	Nickel	7440-02-0	**3,900.0**			53.00	270.00
	Potassium	7440-09-7	NA			260,000.00	620,000.00
	Sodium	7440-23-5	NA			1,500,000.00	3,100,000.00
	Zinc	7440-66-6	NA			24.00	
Organic, Semi-Volatile							
	4-Methylphenol	106-44-5	NA			41.00	
	Phenol	108-95-2	**4,600,000.0**			190.00	1,300.00
Organic, Volatile							
	2-Butanone (MEK)	78-93-3	NA			21.00	84.00
	Acetone	67-64-1	NA			120.00	260.00

Note: NA = not available for this parameter

Table 3-6. Comparison of Detected Parameters For Shallow Zone Compliance Well MW-103

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SK Services (East), L.C.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			900.00	350.00
	Oxidation Reduction Pot		NA			-50.30	-99.40
	pH		NA			6.43	6.69
	Specific Conductivity		NA			4.70	10.56
	Temperature		NA			15.87	14.66
	Turbidity		NA			0.80	2.60
General Chemistry							
	Alkalinity, Total		NA			260,000.00	490,000.00
	Ammonia (as N)	7664-41-7	NA	100.00			
	Carbon Dioxide		NA			577,000.00	524,000.00
	Chloride	16887-00-6	NA	125,000.00	930,000.00	1,100,000.00	3,400,000.00
	Cyanide, Total	57-12-5	NA	10.00		15.00	50.00
	Iron (Ferrous)	15438-31-0	NA	1,500.00		35,700.00	13,100.00
	Methane	74-82-8	NA	713.33		578.00	1,430.00
	Nitrogen, Nitrate	14797-55-8	NA	320.00			
	Solids, Total Dissolved		NA	340,000.00	1,900,000.00		
	Sulfate	14808-79-8	NA			220,000.00	160,000.00
Metals, Total							
	Aluminum	7429-90-5	NA	31,600.00	90.70		340.00
	Antimony	7440-36-0	**4,300.0**	24.80			
	Arsenic	7440-38-2	**0.136**	63.20	7.15		12.00
	Barium	7440-39-3	NA	665.00	453.00	270.00	500.00
	Beryllium	7440-41-7	NA	2.64	0.47		
	Cadmium	7440-43-9	NA		0.21		
	Calcium	7440-70-2	NA	38,600.00	98,800.00	130,000.00	140,000.00
	Chromium	7440-47-3	**3,230.0**	108.00	0.94		110.00
	Cobalt	7440-48-4	NA	53.60	4.03		
	Copper	7440-50-8	NA	1,010.00			
	Iron	7439-89-6	NA	206,000.00	64,900.00	36,000.00	40,000.00
	Lead	7439-92-1	NA	1,400.00			25.00
	Magnesium	7439-95-4	NA	24,700.00	46,600.00	55,000.00	47,000.00
	Manganese	7439-96-5	**100.0**	1,380.00	807.00	970.00	2,400.00
	Mercury	7439-97-6	**0.146**	0.99			
	Nickel	7440-02-0	**3,900.0**	125.00	2.76		
	Potassium	7440-09-7	NA	7,800.00	39,700.00	58,000.00	240,000.00
	Selenium	7782-49-2	NA	1.50			
	Silver	7440-22-4	NA	0.71			
	Sodium	7440-23-5	NA	28,600.00	420,000.00	640,000.00	1,900,000.00
	Thallium	7440-28-0	**6.22**	7.46			
	Vanadium	7440-62-2	NA	141.00			
	Zinc	7440-66-6	NA	781.00			28.00
Organic, Semi-Volatile							
	2-Methylnaphthalene	91-57-6	NA	2.30			
	Acenaphthene	83-32-9	NA	4.40			
	Acenaphthylene	208-96-8	NA	0.61			
	Anthracene	120-12-7	**108,000.0**	1.60			
	Benzo(a)Anthracene	56-55-3	**0.031**	3.70			

Note: NA = not available for this parameter

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
	Benzo(a)Pyrene	50-32-8	**0.031**	2.60			
	Benzo(b)Fluoranthene	205-99-2	**NA**	5.40			
	Benzo(g,h,i)perylene	191-24-2	**NA**	3.00			
	Benzo(k)Fluoranthene	207-08-9	**0.031**	1.70			
	Bis(2-Ethylhexyl) Phthal	117-81-7	**5.92**	0.73			
	Carbazole	86-74-8	**NA**	0.58			
	Chrysene	218-01-9	**0.031**	3.90			
	Dibenz(a,h)anthracene	53-70-3	**0.031**	0.84			
	Dibenzofuran	132-64-9	**NA**	2.10			
	Fluoranthene	206-44-0	**393.0**	6.20			
	Fluorene	86-73-7	**NA**	3.00			
	Indeno(1,2,3-c,d)pyrene	193-39-5	**0.031**	2.50			
	Naphthalene	91-20-3	**NA**	7.60			
	Phenanthrene	85-01-8	**NA**	9.40	1.30		
	Pyrene	129-00-0	**8,970.0**	5.40			
Organic, Volatile							
	Acetone	67-64-1	**NA**	8.50	11.00		
	Methylene chloride	75-09-2	**1,600.0**		2.00		

Note: NA = not available for this parameter

Table 3-6. Comparison of Detected Parameters For Shallow Zone Compliance Well MW-104

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			2,090.00	760.00
	Oxidation Reduction Pot		NA			-113.80	-91.00
	pH		NA			7.21	6.68
	Specific Conductivity		NA			1.60	2.99
	Temperature		NA			11.70	10.56
	Turbidity		NA			0.20	11.60
General Chemistry							
	Alkalinity, Total		NA			210,000.00	130,000.00
	Ammonia (as N)	7664-41-7	NA	330.00			
	Carbon Dioxide		NA			172,000.00	210,000.00
	Chloride	16887-00-6	NA	47,000.00		62,000.00	600,000.00
	Cyanide, Total	57-12-5	NA			14.00	11.00
	Iron (Ferrous)	15438-31-0	NA	390.00		540.00	18,000.00
	Methane	74-82-8	NA	832.34		1,510.00	357.00
	Solids, Total Dissolved		NA	340,000.00			
	Sulfate	14808-79-8	NA			170,000.00	300,000.00
Metals, Total							
	Aluminum	7429-90-5	NA				3,400.00
	Antimony	7440-36-0	**4,300.0**	1.97			
	Barium	7440-39-3	NA				210.00
	Calcium	7440-70-2	NA			120,000.00	120,000.00
	Chromium	7440-47-3	**3,230.0**	8.91			
	Cobalt	7440-48-4	NA	3.10			
	Iron	7439-89-6	NA	20,100.00		3,800.00	17,000.00
	Lead	7439-92-1	NA				12.00
	Magnesium	7439-95-4	NA			21,000.00	23,000.00
	Manganese	7439-96-5	**100.0**			190.00	450.00
	Potassium	7440-09-7	NA			15,000.00	24,000.00
	Sodium	7440-23-5	NA			180,000.00	220,000.00
	Vanadium	7440-62-2	NA	11.90			
Organic, Semi-Volatile							
	2-Methylnaphthalene	91-57-6	NA	2.70			
	Acenaphthene	83-32-9	NA	5.50		12.00	13.00
	Acenaphthylene	208-96-8	NA	1.30			
	Anthracene	120-12-7	**108,000.0**	1.40			
	Benzo(a)Anthracene	56-55-3	**0.031**	2.80			
	Benzo(a)Pyrene	50-32-8	**0.031**	3.10			
	Benzo(b)Fluoranthene	205-99-2	NA	2.70			
	Benzo(g,h,i)perylene	191-24-2	NA	2.10			
	Benzo(k)Fluoranthene	207-08-9	**0.031**	0.66			
	Chrysene	218-01-9	**0.031**	2.30			
	Fluoranthene	206-44-0	**393.0**	3.40			
	Fluorene	86-73-7	NA	1.20			
	Indeno(1,2,3-c,d)pyrene	193-39-5	**0.031**	1.60			
	Phenanthrene	85-01-8	NA	3.70			
	Pyrene	129-00-0	**8,970.0**	6.20			
Organic, Volatile							

Note: NA = not available for this parameter

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
	Benzene	71-43-2	71.0	1.50			10.00
	Ethylbenzene	100-41-4	27,900.0				26.00

Note: NA = not available for this parameter

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Table 3-6. Comparison of Detected Parameters For Shallow Zone Compliance Well MW-106

SK Services (East), L.C.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			4,230.00	710.00
	Oxidation Reduction Pot		NA			-53.40	-99.40
	pH		NA			6.54	6.53
	Specific Conductivity		NA			3.40	6.07
	Temperature		NA			15.80	12.09
	Turbidity		NA			52.40	7.42
General Chemistry							
	Alkalinity, Total		NA			360,000.00	330,000.00
	Ammonia (as N)	7664-41-7	NA	9,900.00			
	Carbon Dioxide		NA			558,000.00	524,000.00
	Chloride	16887-00-6	NA	120,000.00		720,000.00	1,600,000.00
	Cyanide, Total	57-12-5	NA	20.00		35.00	21.00
	Iron (Ferrous)	15438-31-0	NA	1,400.00		5,650.00	15,300.00
	Methane	74-82-8	NA	6,609.54		4,940.00	887.00
	Nitrogen, Nitrate	14797-55-8	NA	120.00			
	Solids, Total Dissolved		NA	520,000.00			
	Sulfate	14808-79-8	NA			260,000.00	430,000.00
Metals, Total							
	Aluminum	7429-90-5	NA	10,100.00			440.00
	Antimony	7440-36-0	**4,300.0**	1.88			
	Arsenic	7440-38-2	**0.136**				44.00
	Barium	7440-39-3	NA	69.70			
	Beryllium	7440-41-7	NA	0.73			
	Calcium	7440-70-2	NA	90,600.00		160,000.00	290,000.00
	Chromium	7440-47-3	**3,230.0**	23.10			
	Cobalt	7440-48-4	NA	8.43			
	Copper	7440-50-8	NA	48.80			
	Iron	7439-89-6	NA	29,000.00		9,700.00	21,000.00
	Lead	7439-92-1	NA	40.20			4.20
	Magnesium	7439-95-4	NA	27,400.00		61,000.00	110,000.00
	Manganese	7439-96-5	**100.0**	351.00		340.00	570.00
	Mercury	7439-97-6	**0.146**	0.86			
	Nickel	7440-02-0	**3,900.0**	19.70			
	Potassium	7440-09-7	NA			41,000.00	100,000.00
	Selenium	7782-49-2	NA	1.62			
	Sodium	7440-23-5	NA	57,100.00		420,000.00	890,000.00
	Vanadium	7440-62-2	NA	36.00			
	Zinc	7440-66-6	NA	174.00			31.00
Organic, Semi-Volatile							
	4-Methylphenol	106-44-5	NA	0.65			
	Bis(2-Ethylhexyl) Phthal	117-81-7	**5.92**	1.30			
	Naphthalene	91-20-3	NA	1.30			
	Phenanthrene	85-01-8	NA	0.65			

Note: NA = not available for this parameter

Table 3-6. Comparison of Detected Parameters For Shallow Zone Compliance Well MW-113

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			1,800.00	260.00
	Oxidation Reduction Pot		NA			-212.20	-189.80
	pH		NA			8.05	7.77
	Specific Conductivity		NA			1.50	1.51
	Temperature		NA			15.57	11.27
	Turbidity		NA			7.20	9.20
General Chemistry							
	Alkalinity, Total		NA			490,000.00	390,000.00
	Carbon Dioxide		NA			483,000.00	398,000.00
	Chloride	16887-00-6	NA			270,000.00	180,000.00
	Cyanide, Total	57-12-5	NA			15.00	
	Methane	74-82-8	NA			3,870.00	2,950.00
	Nitrogen, Nitrate	14797-55-8	NA			120.00	
	Nitrogen, Nitrite and Nit		NA			120.00	
	Sulfate	14808-79-8	NA			5,800.00	24,000.00
Metals, Total							
	Aluminum	7429-90-5	NA				360.00
	Arsenic	7440-38-2	**0.136**				11.00
	Calcium	7440-70-2	NA			100,000.00	120,000.00
	Iron	7439-89-6	NA			4,500.00	3,400.00
	Lead	7439-92-1	NA				18.00
	Magnesium	7439-95-4	NA			26,000.00	27,000.00
	Manganese	7439-96-5	**100.0**			1,100.00	930.00
	Potassium	7440-09-7	NA			25,000.00	19,000.00
	Sodium	7440-23-5	NA			120,000.00	110,000.00
	Zinc	7440-66-6	NA				21.00
Organic, Semi-Volatile							
	2-Methylnaphthalene	91-57-6	NA			12.00	15.00
	Acenaphthylene	208-96-8	NA			10.00	
	Carbazole	86-74-8	NA			22.00	15.00
	Fluorene	86-73-7	NA			13.00	
	Naphthalene	91-20-3	NA			26.00	26.00
	Phenanthrene	85-01-8	NA			20.00	15.00
	Phenol	108-95-2	**4,600,000.0**			13.00	
Organic, Volatile							
	Acetone	67-64-1	NA			22.00	

Note: NA = not available for this parameter

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Table 3-6. Comparison of Detected Parameters For Shallow Zone Compliance Well W-12R

SK Services (East), L.C.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			1,100.00	490.00
	Oxidation Reduction Pot		NA			-87.10	-97.50
	pH		NA			6.49	6.50
	Specific Conductivity		NA			2.30	3.93
	Temperature		NA			14.70	12.15
	Turbidity		NA			75.40	13.60
General Chemistry							
	Alkalinity, Total		NA			310,000.00	310,000.00
	Carbon Dioxide		NA			486,000.00	465,000.00
	Chloride	16887-00-6	NA			470,000.00	950,000.00
	Cyanide, Total	57-12-5	NA			29.00	15.00
	Iron (Ferrous)	15438-31-0	NA			4,030.00	2,900.00
	Methane	74-82-8	NA			4,210.00	712.00
	Sulfate	14808-79-8	NA			89,000.00	140,000.00
Metals, Total							
	Aluminum	7429-90-5	NA			200.00	
	Arsenic	7440-38-2	**0.136**			45.00	20.00
	Calcium	7440-70-2	NA			120,000.00	220,000.00
	Iron	7439-89-6	NA			16,000.00	13,000.00
	Lead	7439-92-1	NA				3.30
	Magnesium	7439-95-4	NA			38,000.00	65,000.00
	Manganese	7439-96-5	**100.0**			350.00	390.00
	Potassium	7440-09-7	NA			30,000.00	40,000.00
	Sodium	7440-23-5	NA			250,000.00	480,000.00

Note: NA = not available for this parameter

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Table 3-6. Comparison of Detected Parameters For Shallow Zone Compliance Well P-19

SK Services (East) L.C.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			1,010.00	1,210.00
	Oxidation Reduction Pot		NA			-66.60	-69.80
	pH		NA			6.64	6.72
	Specific Conductivity		NA			2.66	2.06
	Temperature		NA			9.20	14.72
	Turbidity		NA			0.50	11.40
General Chemistry							
	Alkalinity, Total		NA			310,000.00	370,000.00
	Ammonia (as N)	7664-41-7	NA	1,300.00			
	Carbon Dioxide		NA			367,000.00	541,000.00
	Chloride	16887-00-6	NA	10,000.00		96,000.00	290,000.00
	Cyanide, Total	57-12-5	NA			11.00	37.00
	Iron (Ferrous)	15438-31-0	NA	6,700.00		6,430.00	3,890.00
	Methane	74-82-8	NA	703.56		1,480.00	405.00
	Nitrogen, Nitrate	14797-55-8	NA	280.00		110.00	
	Nitrogen, Nitrite and Nit		NA			110.00	
	Solids, Total Dissolved		NA	430,000.00			
	Sulfate	14808-79-8	NA	52,000.00		110,000.00	18,000.00
Metals, Total							
	Aluminum	7429-90-5	NA	6,930.00			1,300.00
	Antimony	7440-36-0	**4,300.0**	4.74			
	Barium	7440-39-3	NA	110.00			
	Beryllium	7440-41-7	NA	0.80			
	Calcium	7440-70-2	NA	77,900.00		160,000.00	170,000.00
	Chromium	7440-47-3	**3,230.0**	26.60			34.00
	Cobalt	7440-48-4	NA	21.40			
	Copper	7440-50-8	NA	290.00			39.00
	Iron	7439-89-6	NA	124,000.00		21,000.00	21,000.00
	Lead	7439-92-1	NA	312.00			38.00
	Magnesium	7439-95-4	NA	30,500.00		51,000.00	38,000.00
	Manganese	7439-96-5	**100.0**	411.00		540.00	570.00
	Mercury	7439-97-6	**0.146**	1.30			
	Nickel	7440-02-0	**3,900.0**	96.50			
	Potassium	7440-09-7	NA			15,000.00	17,000.00
	Sodium	7440-23-5	NA	39,000.00		230,000.00	150,000.00
	Thallium	7440-28-0	**6.22**	6.53			
	Vanadium	7440-62-2	NA	23.60			
	Zinc	7440-66-6	NA	846.00		370.00	410.00
Organic, Semi-Volatile							
	Anthracene	120-12-7	**108,000.0**	0.59			
	Benzo(a)Anthracene	56-55-3	**0.031**	3.20			
	Benzo(a)Pyrene	50-32-8	**0.031**	2.90			
	Benzo(b)Fluoranthene	205-99-2	NA	4.50			
	Benzo(g,h,i)perylene	191-24-2	NA	1.30			
	Benzo(k)Fluoranthene	207-08-9	**0.031**	1.30			
	Chrysene	218-01-9	**0.031**	3.20			
	Fluoranthene	206-44-0	**393.0**	4.00			

Note: NA = not available for this parameter

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
	Indeno(1,2,3-c,d)pyrene	193-39-5	**0.031**	1.30			
	Phenanthrene	85-01-8	**NA**	1.30			
	Pyrene	129-00-0	**8,970.0**	4.30			

Note: NA = not available for this parameter

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Table 3-6. Comparison of Detected Parameters For Shallow Zone Compliance Well SWW-25

SK Services (East), L.C.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			3,200.00	1,250.00
	Oxidation Reduction Pot		NA			8.90	-62.10
	pH		NA			6.59	6.49
	Specific Conductivity		NA			2.50	3.80
	Temperature		NA			10.33	12.07
	Turbidity		NA			3.20	5.80
General Chemistry							
	Alkalinity, Total		NA			170,000.00	220,000.00
	Ammonia (as N)	7664-41-7	NA	3,800.00			
	Carbon Dioxide		NA			238,000.00	319,000.00
	Chloride	16887-00-6	NA	110,000.00		3,700,000.00	820,000.00
	Cyanide, Total	57-12-5	NA	130.00		24.00	25.00
	Iron (Ferrous)	15438-31-0	NA			4,060.00	11,600.00
	Methane	74-82-8	NA	196.77		123.00	153.00
	Nitrogen, Nitrate	14797-55-8	NA	240.00		450.00	
	Nitrogen, Nitrite and Nit		NA			450.00	
	Solids, Total Dissolved		NA	410,000.00			
	Sulfate	14808-79-8	NA			350,000.00	430,000.00
Metals, Total							
	Aluminum	7429-90-5	NA	15,700.00			9,000.00
	Antimony	7440-36-0	**4,300.0**	10.80			
	Arsenic	7440-38-2	**0.136**			23.00	
	Barium	7440-39-3	NA	385.00			230.00
	Beryllium	7440-41-7	NA	1.13			
	Cadmium	7440-43-9	NA	0.13			5.80
	Calcium	7440-70-2	NA	83,100.00		160,000.00	250,000.00
	Chromium	7440-47-3	**3,230.0**	46.30		11.00	150.00
	Cobalt	7440-48-4	NA	47.80			
	Copper	7440-50-8	NA	676.00			250.00
	Iron	7439-89-6	NA	53,300.00		7,800.00	42,000.00
	Lead	7439-92-1	NA	344.00			49.00
	Magnesium	7439-95-4	NA	33,500.00		36,000.00	61,000.00
	Manganese	7439-96-5	**100.0**	463.00		270.00	700.00
	Mercury	7439-97-6	**0.146**	0.96			0.61
	Nickel	7440-02-0	**3,900.0**	186.00		130.00	
	Potassium	7440-09-7	NA			39,000.00	52,000.00
	Silver	7440-22-4	NA	0.41			
	Sodium	7440-23-5	NA	39,900.00		230,000.00	440,000.00
	Thallium	7440-28-0	**6.22**	5.66			
	Vanadium	7440-62-2	NA	73.10			
	Zinc	7440-66-6	NA	288.00		58.00	58.00
Organic, Semi-Volatile							
	Acenaphthene	83-32-9	NA	10.00			
	Benzo(a)Anthracene	56-55-3	**0.031**	1.50			
	Benzo(a)Pyrene	50-32-8	**0.031**	1.70			
	Benzo(b)Fluoranthene	205-99-2	NA	2.70			
	Benzo(g,h,i)perylene	191-24-2	NA	0.84			

Note: NA = not available for this parameter

Parameter Type	Parameter Name	CAS #.	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
	Benzo(k)Fluoranthene	207-08-9	**0.031**	0.73			
	Chrysene	218-01-9	**0.031**	1.40			
	Fluoranthene	206-44-0	**393.0**	1.80			
	Indeno(1,2,3-c,d)pyrene	193-39-5	**0.031**	0.85			
	Pyrene	129-00-0	**8,970.0**	1.70			
Organic, Volatile							
	Benzene	71-43-2	**71.0**	4.80			

Note: NA = not available for this parameter

Table 3-6. Comparison of Detected Parameters For Shallow Zone Monitoring Well MW-105

SK Services (East), L.C.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			4,210.00	780.00
	Oxidation Reduction Pot		NA			-37.60	-110.30
	pH		NA			6.43	6.40
	Specific Conductivity		NA			2.80	6.78
	Temperature		NA			14.70	12.03
	Turbidity		NA			0.00	6.20
General Chemistry							
	Alkalinity, Total		NA			230,000.00	230,000.00
	Ammonia (as N)	7664-41-7	NA	2,600.00			
	Carbon Dioxide		NA			348,000.00	424,000.00
	Chloride	16887-00-6	NA	70,000.00		620,000.00	2,100,000.00
	Cyanide, Free	57-12-5	**1.0**				19.00
	Cyanide, Total	57-12-5	NA	40.00		19.00	23.00
	Iron (Ferrous)	15438-31-0	NA	670.00		9,560.00	16,300.00
	Methane	74-82-8	NA	1,601.21		1,560.00	534.00
	Nitrogen, Nitrate	14797-55-8	NA	120.00			
	Solids, Total Dissolved		NA	1,200,000.00			
	Sulfate	14808-79-8	NA	520,000.00		220,000.00	330,000.00
Metals, Total							
	Aluminum	7429-90-5	NA				210.00
	Antimony	7440-36-0	**4,300.0**	2.58			
	Arsenic	7440-38-2	**0.136**			240.00	91.00
	Beryllium	7440-41-7	NA	0.26			
	Calcium	7440-70-2	NA			160,000.00	240,000.00
	Chromium	7440-47-3	**3,230.0**				160.00
	Cobalt	7440-48-4	NA	2.95			
	Iron	7439-89-6	NA	31,300.00		18,000.00	21,000.00
	Magnesium	7439-95-4	NA			42,000.00	55,000.00
	Manganese	7439-96-5	**100.0**			450.00	950.00
	Potassium	7440-09-7	NA			28,000.00	170,000.00
	Selenium	7782-49-2	NA	1.94			
	Sodium	7440-23-5	NA			350,000.00	1,200,000.00
	Thallium	7440-28-0	**6.22**	2.34			
	Vanadium	7440-62-2	NA	15.50			
	Zinc	7440-66-6	NA				25.00
Organic, Semi-Volatile							
	2-Methylnaphthalene	91-57-6	NA	1.80			
	Fluorene	86-73-7	NA	0.67			
	Naphthalene	91-20-3	NA				13.00
Organic, Volatile							
	Acetone	67-64-1	NA				38.00
	Benzene	71-43-2	**71.0**	14.00			
	total 1,2-Dichloroethene	540-59-0	NA	4.70			

Note: NA = not available for this parameter

Table 3-6. Comparison of Detected Parameters For Shallow Zone Monitoring Well MW-108

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			100.00	200.00
	Oxidation Reduction Pot		NA			-394.50	-331.50
	pH		NA			8.74	8.51
	Specific Conductivity		NA			8.90	6.05
	Temperature		NA			13.51	10.71
	Turbidity		NA			191.30	411.10
General Chemistry							
	Alkalinity, Total		NA			1,800,000.00	1,400,000.00
	Ammonia (as N)	7664-41-7	NA	23,000.00			
	Carbon Dioxide		NA			1,600,000.00	1,220,000.00
	Chloride	16887-00-6	NA	1,900,000.00			1,300,000.00
	Cyanide, Total	57-12-5	NA				13.00
	Iron (Ferrous)	15438-31-0	NA	14,000.00			
	Methane	74-82-8	NA	16,557.91		17,500.00	11,900.00
	Solids, Total Dissolved		NA	5,300,000.00			
	Sulfate	14808-79-8	NA			11,000.00	170,000.00
Metals, Total							
	Aluminum	7429-90-5	NA	12,800.00		3,400.00	2,000.00
	Antimony	7440-36-0	**4,300.0**	50.00			
	Barium	7440-39-3	NA	209.00			
	Beryllium	7440-41-7	NA	1.08			
	Cadmium	7440-43-9	NA	1.02			
	Calcium	7440-70-2	NA	27,400.00		5,400.00	
	Chromium	7440-47-3	**3,230.0**	34,400.00		1,900.00	540.00
	Cobalt	7440-48-4	NA	21.40			
	Copper	7440-50-8	NA	138.00			
	Iron	7439-89-6	NA	21,600.00		270.00	240.00
	Lead	7439-92-1	NA	284.00		5.10	
	Magnesium	7439-95-4	NA	30,600.00		16,000.00	15,000.00
	Manganese	7439-96-5	**100.0**	434.00		40.00	29.00
	Mercury	7439-97-6	**0.146**	1.90		0.35	0.49
	Nickel	7440-02-0	**3,900.0**	124.00		44.00	
	Potassium	7440-09-7	NA			35,000.00	32,000.00
	Silver	7440-22-4	NA	0.50			
	Sodium	7440-23-5	NA	1,467,000.00		1,500,000.00	1,400,000.00
	Thallium	7440-28-0	**6.22**	16.10			
	Vanadium	7440-62-2	NA	930.00		590.00	290.00
	Zinc	7440-66-6	NA	666.00		61.00	20.00
Organic, Semi-Volatile							
	1,4-Dichlorobenzene	106-46-7	**3,159.0**	180.00		400.00	310.00
	2,4-Dichlorophenol	120-83-2	**794.0**	2.30			
	2,4-Dimethylphenol	105-67-9	NA	84.00			180.00
	2-Methylphenol	95-48-7	NA	38.00			200.00
	4-Methylphenol	106-44-5	NA	35.00			
	Acenaphthene	83-32-9	NA	6.80			
	Naphthalene	91-20-3	NA	770.00		1,700.00	1,500.00
	Phenol	108-95-2	**4,600,000.0**	19.00			

Note: NA = not available for this parameter

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Organic, Volatile							
	Benzene	71-43-2	**71.0**	170.00		12.00	95.00
	Chlorobenzene	108-90-7	**21,000.0**	320.00		49.00	210.00
	Toluene	108-88-3	**200,000.0**	14.00			17.00
	Total Xylenes	1330-20-7	**NA**	24.00			36.00

Note: NA = not available for this parameter

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Table 3-6. Comparison of Detected Parameters For Shallow Zone Monitoring Well MW-109

SK Services (East), L.C.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			4,230.00	670.00
	Oxidation Reduction Pot		NA			-7.20	13.70
	pH		NA			6.07	6.01
	Specific Conductivity		NA			1.30	1.03
	Temperature		NA			12.20	8.09
	Turbidity		NA			1.90	0.90
General Chemistry							
	Alkalinity, Total		NA			170,000.00	120,000.00
	Ammonia (as N)	7664-41-7	NA	1,500.00			
	Carbon Dioxide		NA			120,000.00	248,000.00
	Chloride	16887-00-6	NA	410,000.00		300,000.00	210,000.00
	Iron (Ferrous)	15438-31-0	NA			15,000.00	18,900.00
	Methane	74-82-8	NA	1,228.51		5,640.00	2,790.00
	Nitrogen, Nitrate	14797-55-8	NA	110.00			
	Solids, Total Dissolved		NA	810,000.00			
	Sulfate	14808-79-8	NA			3,200.00	22,000.00
Metals, Total							
	Aluminum	7429-90-5	NA	5,680.00			
	Arsenic	7440-38-2	**0.136**	2.29			
	Barium	7440-39-3	NA	139.00		280.00	
	Beryllium	7440-41-7	NA	0.44			
	Calcium	7440-70-2	NA	30,400.00		64,000.00	45,000.00
	Chromium	7440-47-3	**3,230.0**	16.30			
	Cobalt	7440-48-4	NA	4.61			
	Copper	7440-50-8	NA	21.40			
	Iron	7439-89-6	NA	18,300.00		27,000.00	17,000.00
	Lead	7439-92-1	NA	6.19		3.20	
	Magnesium	7439-95-4	NA	17,400.00		24,000.00	19,000.00
	Manganese	7439-96-5	**100.0**	1,170.00		2,800.00	1,900.00
	Mercury	7439-97-6	**0.146**				0.45
	Nickel	7440-02-0	**3,900.0**	10.40			
	Potassium	7440-09-7	NA			6,000.00	5,200.00
	Sodium	7440-23-5	NA	137,000.00		150,000.00	120,000.00
	Vanadium	7440-62-2	NA	9.27			
	Zinc	7440-66-6	NA	37.30		22.00	
Organic, Semi-Volatile							
	1,2-Dichlorobenzene	95-50-1	**16,500.0**	9.20			
	1,3-Dichlorobenzene	541-73-1	**22,200.0**	9.10			
	1,4-Dichlorobenzene	106-46-7	**3,159.0**	25.00		20.00	12.00
	Bis(2-Ethylhexyl) Phthal	117-81-7	**5.92**	1.70			
Organic, Volatile							
	Benzene	71-43-2	**71.0**	2.30		50.00	10.00
	Chlorobenzene	108-90-7	**21,000.0**	170.00		350.00	190.00
	Methylene chloride	75-09-2	**1,600.0**			13.00	

Note: NA = not available for this parameter

Table 3-6. Comparison of Detected Parameters For Shallow Zone Monitoring Well MW-110

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			1,100.00	310.00
	Oxidation Reduction Pot		NA			-79.70	-153.40
	pH		NA			6.62	6.69
	Specific Conductivity		NA			7.70	8.45
	Temperature		NA			13.28	11.37
	Turbidity		NA			59.70	26.80
General Chemistry							
	Alkalinity, Total		NA			560,000.00	600,000.00
	Carbon Dioxide		NA			896,000.00	560,000.00
	Chloride	16887-00-6	NA	1,100,000.00	1,660,000.00	2,000,000.00	2,700,000.00
	Cyanide, Free	57-12-5	**1.0**	10.00			
	Cyanide, Total	57-12-5	NA	150.00		110.00	82.00
	Iron (Ferrous)	15438-31-0	NA			34,700.00	24,100.00
	Methane	74-82-8	NA			9,520.00	5,320.00
	Nitrogen, Nitrate	14797-55-8	NA			130.00	
	Nitrogen, Nitrite and Nit		NA			130.00	
	Solids, Total Dissolved		NA	2,300,000.00	2,900,000.00		
	Sulfate	14808-79-8	NA			3,800.00	18,000.00
Metals, Total							
	Aluminum	7429-90-5	NA	1,050.00	31.70	460.00	
	Arsenic	7440-38-2	**0.136**	10.20	4.35	15.00	12.00
	Barium	7440-39-3	NA	530.00	941.00	940.00	1,200.00
	Beryllium	7440-41-7	NA		0.55		
	Cadmium	7440-43-9	NA		0.32		
	Calcium	7440-70-2	NA	84,800.00	92,900.00	110,000.00	140,000.00
	Chromium	7440-47-3	**3,230.0**	15.00	1.86	12.00	
	Cobalt	7440-48-4	NA	1.91	0.25		
	Copper	7440-50-8	NA	14.40		32.00	
	Iron	7439-89-6	NA	24,000.00	25,600.00	49,000.00	47,000.00
	Lead	7439-92-1	NA	18.80		13.00	
	Magnesium	7439-95-4	NA	84,100.00	90,000.00	120,000.00	110,000.00
	Manganese	7439-96-5	**100.0**	628.00	563.00	740.00	690.00
	Mercury	7439-97-6	**0.146**	2.37			0.32
	Nickel	7440-02-0	**3,900.0**	8.99	1.50		
	Potassium	7440-09-7	NA	46,400.00	92,300.00	63,000.00	120,000.00
	Selenium	7782-49-2	NA	2.40			
	Sodium	7440-23-5	NA	635,000.00	885,000.00	1,200,000.00	1,500,000.00
	Thallium	7440-28-0	**6.22**	4.43			
	Vanadium	7440-62-2	NA	15.50			
	Zinc	7440-66-6	NA	67.10		49.00	70.00
Organic, Semi-Volatile							
	2-Methylnaphthalene	91-57-6	NA	1.40			
	Acenaphthene	83-32-9	NA		25.00	24.00	38.00
	Acenaphthylene	208-96-8	NA	2.60	2.20		
	Anthracene	120-12-7	**108,000.0**	1.00			
	Carbazole	86-74-8	NA	7.50			
	Dibenzofuran	132-64-9	NA	2.90	1.30		

Note: NA = not available for this parameter

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
	Fluorene	86-73-7	NA	4.00			
	Naphthalene	91-20-3	NA	1.30			
	Phenanthrene	85-01-8	NA	2.20			
	Pyrene	129-00-0	**8,970.0**	0.62			
Organic, Volatile							
	Acetone	67-64-1	NA	3.30	12.00		
	Benzene	71-43-2	**71.0**		6.90		
	Methylene chloride	75-09-2	**1,600.0**		2.00		

Note: NA = not available for this parameter

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Table 3-6. Comparison of Detected Parameters For Shallow Zone Monitoring Well MW-112

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			2,470.00	3,960.00
	Oxidation Reduction Pot		NA			-20.50	-37.30
	pH		NA			6.20	6.34
	Specific Conductivity		NA			7.00	6.19
	Temperature		NA			11.90	10.85
	Turbidity		NA			7.70	22.70
General Chemistry							
	Alkalinity, Total		NA			170,000.00	180,000.00
	Carbon Dioxide		NA			481,000.00	329,000.00
	Chloride	16887-00-6	NA	46,000.00	1,560,000.00	1,800,000.00	1,400,000.00
	Cyanide, Free	57-12-5	**1.0**			10.00	
	Cyanide, Total	57-12-5	NA	510.00	220.00	300.00	160.00
	Iron (Ferrous)	15438-31-0	NA			48,400.00	70,800.00
	Methane	74-82-8	NA			1,940.00	837.00
	Solids, Total Dissolved		NA	340,000.00	2,600,000.00		
	Sulfate	14808-79-8	NA			220,000.00	670,000.00
Metals, Total							
	Aluminum	7429-90-5	NA	2,960.00	71.00		
	Arsenic	7440-38-2	**0.136**	20.50	3.64	14.00	12.00
	Barium	7440-39-3	NA	248.00	692.00	690.00	220.00
	Beryllium	7440-41-7	NA		0.93		
	Cadmium	7440-43-9	NA		0.25	8.00	
	Calcium	7440-70-2	NA	23,100.00	62,400.00	120,000.00	81,000.00
	Chromium	7440-47-3	**3,230.0**	10.50	1.10	34.00	20.00
	Cobalt	7440-48-4	NA	6.81	4.80		
	Copper	7440-50-8	NA	14.40		46.00	
	Iron	7439-89-6	NA	23,600.00	29,000.00	71,000.00	99,000.00
	Lead	7439-92-1	NA	20.10		3.70	
	Magnesium	7439-95-4	NA	9,050.00	18,600.00	27,000.00	25,000.00
	Manganese	7439-96-5	**100.0**	411.00	734.00	2,200.00	2,400.00
	Mercury	7439-97-6	**0.146**	2.98			
	Nickel	7440-02-0	**3,900.0**	7.23	2.20		
	Potassium	7440-09-7	NA	11,100.00	101,000.00	140,000.00	150,000.00
	Sodium	7440-23-5	NA	46,200.00	833,000.00	1,200,000.00	1,100,000.00
	Vanadium	7440-62-2	NA	11.60			
	Zinc	7440-66-6	NA	25.30			
Organic, Semi-Volatile							
	Acenaphthene	83-32-9	NA	0.70	5.20		
	Benzo(b)Fluoranthene	205-99-2	NA	0.62			
	Butyl Benzyl Phthalate	85-68-7	**416.0**		3.00		
	Fluorene	86-73-7	NA		1.60		
	Pyrene	129-00-0	**8,970.0**	0.56			
Organic, Volatile							
	Acetone	67-64-1	NA	5.40	10.00		

Note: NA = not available for this parameter

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Table 3-6. Comparison of Detected Parameters For Shallow Zone Monitoring Well MW-116

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			14,020.00	1,020.00
	Oxidation Reduction Pot		NA			-78.10	-49.50
	pH		NA			6.56	6.50
	Specific Conductivity		NA			2.00	2.50
	Temperature		NA			12.13	8.55
	Turbidity		NA			8.30	58.50
General Chemistry							
	Alkalinity, Total		NA			260,000.00	200,000.00
	Carbon Dioxide		NA			1,460,000.00	360,000.00
	Chloride	16887-00-6	NA			400,000.00	450,000.00
	Cyanide, Total	57-12-5	NA			30.00	26.00
	Iron (Ferrous)	15438-31-0	NA			41,500.00	47,500.00
	Methane	74-82-8	NA			6,730.00	8,080.00
	Nitrogen, Nitrite and Nit		NA			61.00	
	Sulfate	14808-79-8	NA			67,000.00	50,000.00
Metals, Total							
	Barium	7440-39-3	NA			460.00	480.00
	Cadmium	7440-43-9	NA			6.60	
	Calcium	7440-70-2	NA			71,000.00	84,000.00
	Copper	7440-50-8	NA			35.00	
	Iron	7439-89-6	NA			66,000.00	63,000.00
	Magnesium	7439-95-4	NA			35,000.00	37,000.00
	Manganese	7439-96-5	**100.0**			1,300.00	1,300.00
	Potassium	7440-09-7	NA			11,000.00	14,000.00
	Sodium	7440-23-5	NA			240,000.00	270,000.00
	Zinc	7440-66-6	NA				1,800.00
Organic, Semi-Volatile							
	Acenaphthene	83-32-9	NA			130.00	96.00
	Carbazole	86-74-8	NA			470.00	180.00
	Fluorene	86-73-7	NA				52.00
	Phenanthrene	85-01-8	NA				38.00
Organic, Volatile							
	Acetone	67-64-1	NA				26.00

Note: NA = not available for this parameter

Table 3-6. Comparison of Detected Parameters For Shallow Zone Monitoring Well MW-117

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			7,590.00	460.00
	Oxidation Reduction Pot		NA			-63.60	-102.50
	pH		NA			6.95	6.95
	Specific Conductivity		NA			3.20	3.56
	Temperature		NA			13.80	12.53
	Turbidity		NA			1,273.00	2.10
General Chemistry							
	Alkalinity, Total		NA			590,000.00	460,000.00
	Carbon Dioxide		NA			696,000.00	452,000.00
	Chloride	16887-00-6	NA			590,000.00	840,000.00
	Cyanide, Free	57-12-5	**1.0**				12.00
	Cyanide, Total	57-12-5	NA			43.00	98.00
	Iron (Ferrous)	15438-31-0	NA			150.00	9,910.00
	Methane	74-82-8	NA			15,700.00	9,010.00
	Sulfate	14808-79-8	NA				45,000.00
Metals, Total							
	Barium	7440-39-3	NA			540.00	640.00
	Calcium	7440-70-2	NA			120,000.00	170,000.00
	Iron	7439-89-6	NA			21,000.00	20,000.00
	Magnesium	7439-95-4	NA			52,000.00	56,000.00
	Manganese	7439-96-5	**100.0**			450.00	520.00
	Potassium	7440-09-7	NA			26,000.00	35,000.00
	Sodium	7440-23-5	NA			370,000.00	480,000.00

Note: NA = not available for this parameter

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Table 3-6. Comparison of Detected Parameters For Shallow Zone Monitoring Well MW-118

SK Services (East), L.C.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			13,660.00	1,230.00
	Oxidation Reduction Pot		NA			-34.80	-60.90
	pH		NA			6.42	6.32
	Specific Conductivity		NA			3.40	3.60
	Temperature		NA			13.30	7.63
	Turbidity		NA			24.20	20.90
General Chemistry							
	Alkalinity, Total		NA			810,000.00	690,000.00
	Carbon Dioxide		NA			1,440,000.00	770,000.00
	Chloride	16887-00-6	NA			500,000.00	380,000.00
	Cyanide, Total	57-12-5	NA			45.00	46.00
	Iron (Ferrous)	15438-31-0	NA			31,100.00	
	Methane	74-82-8	NA			6,280.00	8,290.00
	Sulfate	14808-79-8	NA			32,000.00	18,000.00
Metals, Total							
	Aluminum	7429-90-5	NA				260.00
	Arsenic	7440-38-2	**0.136**			11.00	10.00
	Barium	7440-39-3	NA			520.00	490.00
	Calcium	7440-70-2	NA			110,000.00	90,000.00
	Iron	7439-89-6	NA			41,000.00	44,000.00
	Lead	7439-92-1	NA			4.00	9.90
	Magnesium	7439-95-4	NA			54,000.00	64,000.00
	Manganese	7439-96-5	**100.0**			3,300.00	3,500.00
	Potassium	7440-09-7	NA			20,000.00	23,000.00
	Sodium	7440-23-5	NA			470,000.00	470,000.00
Organic, Semi-Volatile							
	Acenaphthene	83-32-9	NA			11.00	
	Carbazole	86-74-8	NA			14.00	
	Phenanthrene	85-01-8	NA			14.00	13.00
Organic, Volatile							
	Acetone	67-64-1	NA			14.00	

Note: NA = not available for this parameter

SK Services (East), L.C.

Table 3-6. Comparison of Detected Parameters For Shallow Zone Monitoring Well MW-119

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			1,200.00	190.00
	Oxidation Reduction Pot		NA			-175.20	-144.40
	pH		NA			6.90	7.65
	Specific Conductivity		NA			26.80	5.03
	Temperature		NA			15.60	6.82
	Turbidity		NA			29.60	17.40
General Chemistry							
	Alkalinity, Total		NA			270,000.00	280,000.00
	Carbon Dioxide		NA			499,000.00	266,000.00
	Chloride	16887-00-6	NA			8,800,000.00	1,400,000.00
	Cyanide, Total	57-12-5	NA			85.00	42.00
	Iron (Ferrous)	15438-31-0	NA			16,200.00	
	Methane	74-82-8	NA			1,250.00	191.00
	Sulfate	14808-79-8	NA			1,100,000.00	310,000.00
Metals, Total							
	Aluminum	7429-90-5	NA			330.00	
	Arsenic	7440-38-2	**0.136**			46.00	20.00
	Barium	7440-39-3	NA			490.00	
	Calcium	7440-70-2	NA			80,000.00	130,000.00
	Chromium	7440-47-3	**3,230.0**				270.00
	Iron	7439-89-6	NA			800.00	2,400.00
	Lead	7439-92-1	NA			3.60	
	Magnesium	7439-95-4	NA			39,000.00	95,000.00
	Manganese	7439-96-5	**100.0**			1,000.00	94.00
	Mercury	7439-97-6	**0.146**				0.46
	Potassium	7440-09-7	NA			7,000.00	81,000.00
	Sodium	7440-23-5	NA			420,000.00	880,000.00
	Zinc	7440-66-6	NA			31.00	
Organic, Semi-Volatile							
	2-Methylnaphthalene	91-57-6	NA				12.00
	Acenaphthene	83-32-9	NA				12.00
	Acenaphthylene	208-96-8	NA				12.00
	Carbazole	86-74-8	NA				23.00
	Dibenzofuran	132-64-9	NA				17.00
	Fluoranthene	206-44-0	**393.0**				13.00
	Fluorene	86-73-7	NA				18.00
	Naphthalene	91-20-3	NA			790.00	
	Phenanthrene	85-01-8	NA				38.00
	Pyrene	129-00-0	**8,970.0**				11.00

Note: NA = not available for this parameter

Table 3-6. Comparison of Detected Parameters For Shallow Zone Monitoring Well MW-120

SK Services (East), L.C.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			7,200.00	1,270.00
	Oxidation Reduction Pot		NA			-235.10	-67.80
	pH		NA			6.21	6.26
	Specific Conductivity		NA			24.70	15.60
	Temperature		NA			10.10	12.26
	Turbidity		NA			1.40	9.40
General Chemistry							
	Alkalinity, Total		NA			280,000.00	390,000.00
	Carbon Dioxide		NA			600,000.00	395,000.00
	Chloride	16887-00-6	NA			8,300,000.00	4,100,000.00
	Cyanide, Total	57-12-5	NA				47.00
	Iron (Ferrous)	15438-31-0	NA			3,020.00	10,700.00
	Methane	74-82-8	NA			3,290.00	1,620.00
	Nitrogen, Nitrate	14797-55-8	NA			340.00	13,000.00
	Nitrogen, Nitrite	14797-65-0	NA				180.00
	Nitrogen, Nitrite and Nit		NA			340.00	13,000.00
	Sulfate	14808-79-8	NA			1,000,000.00	780,000.00
Metals, Total							
	Aluminum	7429-90-5	NA				240.00
	Arsenic	7440-38-2	**0.136**			33.00	26.00
	Calcium	7440-70-2	NA			210,000.00	160,000.00
	Chromium	7440-47-3	**3,230.0**			48.00	470.00
	Iron	7439-89-6	NA			2,400.00	12,000.00
	Magnesium	7439-95-4	NA			550,000.00	330,000.00
	Manganese	7439-96-5	**100.0**			380.00	350.00
	Mercury	7439-97-6	**0.146**				0.40
	Potassium	7440-09-7	NA			170,000.00	110,000.00
	Sodium	7440-23-5	NA			4,500,000.00	2,400,000.00
Organic, Semi-Volatile							
	Phenanthrene	85-01-8	NA			10.00	

Note: NA = not available for this parameter

SK Services (East), L.C.

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Table 3-6. Comparison of Detected Parameters For Shallow Zone Monitoring Well MW-121

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			2,720.00	180.00
	Oxidation Reduction Pot		NA			107.10	57.40
	pH		NA			5.61	5.84
	Specific Conductivity		NA			4.30	3.79
	Temperature		NA			13.70	8.53
	Turbidity		NA			186.50	3.80
General Chemistry							
	Alkalinity, Total		NA			60,000.00	84,000.00
	Carbon Dioxide		NA			220,000.00	123,000.00
	Chloride	16887-00-6	NA			1,200,000.00	1,200,000.00
	Iron (Ferrous)	15438-31-0	NA			34,400.00	9,310.00
	Methane	74-82-8	NA			147.00	246.00
	Sulfate	14808-79-8	NA			84,000.00	200,000.00
Metals, Total							
	Arsenic	7440-38-2	**0.136**			53.00	17.00
	Barium	7440-39-3	NA			210.00	
	Calcium	7440-70-2	NA			65,000.00	69,000.00
	Chromium	7440-47-3	**3,230.0**			13.00	400.00
	Iron	7439-89-6	NA			20,000.00	12,000.00
	Lead	7439-92-1	NA			16.00	
	Magnesium	7439-95-4	NA			79,000.00	81,000.00
	Manganese	7439-96-5	**100.0**			470.00	400.00
	Potassium	7440-09-7	NA			29,000.00	57,000.00
	Sodium	7440-23-5	NA			600,000.00	700,000.00
	Zinc	7440-66-6	NA			34.00	
Organic, Semi-Volatile							
	Naphthalene	91-20-3	NA			910.00	270.00
Organic, Volatile							
	Total Xylenes	1330-20-7	NA			11.00	

Note: NA = not available for this parameter

Table 3-6. Comparison of Detected Parameters For Shallow Zone Monitoring Well MW-122

SK Services (East), L.C.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			680.00	630.00
	Oxidation Reduction Pot		NA			17.10	-43.60
	pH		NA			6.22	6.34
	Specific Conductivity		NA			8.20	7.82
	Temperature		NA			12.20	11.28
	Turbidity		NA			416.00	0.50
General Chemistry							
	Alkalinity, Total		NA			150,000.00	790,000.00
	Carbon Dioxide		NA			384,000.00	235,000.00
	Chloride	16887-00-6	NA			2,200,000.00	2,500,000.00
	Iron (Ferrous)	15438-31-0	NA			42,500.00	66,800.00
	Methane	74-82-8	NA			279.00	84.00
	Nitrogen, Nitrite and Nit		NA			85.00	
	Sulfate	14808-79-8	NA			560,000.00	310,000.00
Metals, Total							
	Arsenic	7440-38-2	**0.136**			13.00	15.00
	Calcium	7440-70-2	NA			110,000.00	120,000.00
	Chromium	7440-47-3	**3,230.0**				34.00
	Copper	7440-50-8	NA			31.00	
	Iron	7439-89-6	NA			51,000.00	70,000.00
	Lead	7439-92-1	NA			6.30	
	Magnesium	7439-95-4	NA			100,000.00	120,000.00
	Manganese	7439-96-5	**100.0**			2,700.00	2,300.00
	Mercury	7439-97-6	**0.146**				0.30
	Potassium	7440-09-7	NA			130,000.00	130,000.00
	Sodium	7440-23-5	NA			1,300,000.00	1,300,000.00
	Zinc	7440-66-6	NA			46.00	44.00
Organic, Semi-Volatile							
	Di-N-Butyl phthalate	84-74-2	**15,700.0**			11.00	

Note: NA = not available for this parameter

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			2,600.00	310.00
	Oxidation Reduction Pot		NA			-35.10	-72.30
	pH		NA			6.43	6.92
	Specific Conductivity		NA			8.50	5.23
	Temperature		NA			12.57	7.97
	Turbidity		NA			220.50	2.20
General Chemistry							
	Alkalinity, Total		NA			260,000.00	200,000.00
	Carbon Dioxide		NA			283,000.00	225,000.00
	Chloride	16887-00-6	NA			2,100,000.00	1,800,000.00
	Cyanide, Total	57-12-5	NA			200.00	
	Iron (Ferrous)	15438-31-0	NA			35,800.00	14,000.00
	Methane	74-82-8	NA			680.00	64.00
	Sulfate	14808-79-8	NA			300,000.00	190,000.00
Metals, Total							
	Arsenic	7440-38-2	**0.136**			11.00	
	Barium	7440-39-3	NA			290.00	
	Calcium	7440-70-2	NA			150,000.00	100,000.00
	Chromium	7440-47-3	**3,230.0**			24.00	
	Copper	7440-50-8	NA			32.00	
	Iron	7439-89-6	NA			51,000.00	19,000.00
	Lead	7439-92-1	NA			4.40	
	Magnesium	7439-95-4	NA			130,000.00	73,000.00
	Manganese	7439-96-5	**100.0**			1,600.00	490.00
	Potassium	7440-09-7	NA			76,000.00	100,000.00
	Sodium	7440-23-5	NA			1,100,000.00	1,100,000.00
	Zinc	7440-66-6	NA			25.00	

Note: NA = not available for this parameter

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Table 3-6. Comparison of Detected Parameters For Shallow Zone Monitoring Well MW-124

SK Services (East), L.C.

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			1,260.00	410.00
	Oxidation Reduction Pot		NA			-72.10	-152.70
	pH		NA			6.89	6.85
	Specific Conductivity		NA			5.80	3.24
	Temperature		NA			14.01	12.95
	Turbidity		NA			386.00	8.60
General Chemistry							
	Alkalinity, Total		NA			560,000.00	710,000.00
	Carbon Dioxide		NA			1,060,000.00	679,000.00
	Chloride	16887-00-6	NA			670,000.00	660,000.00
	Cyanide, Free	57-12-5	**1.0**			21.00	
	Cyanide, Total	57-12-5	NA			28.00	110.00
	Iron (Ferrous)	15438-31-0	NA				890.00
	Methane	74-82-8	NA			15,700.00	8,300.00
	Sulfate	14808-79-8	NA			69,000.00	35,000.00
Metals, Total							
	Arsenic	7440-38-2	**0.136**			14.00	
	Calcium	7440-70-2	NA			110,000.00	190,000.00
	Iron	7439-89-6	NA			13,000.00	10,000.00
	Lead	7439-92-1	NA				11.00
	Magnesium	7439-95-4	NA			59,000.00	61,000.00
	Manganese	7439-96-5	**100.0**			390.00	360.00
	Potassium	7440-09-7	NA			36,000.00	25,000.00
	Sodium	7440-23-5	NA			420,000.00	280,000.00
Organic, Semi-Volatile							
	2,4-Dimethylphenol	105-67-9	NA			2,900.00	4,400.00
	2-Methylphenol	95-48-7	NA			1,500.00	3,000.00
	4-Methylphenol	106-44-5	NA				640.00
	Naphthalene	91-20-3	NA			8,100.00	7,000.00
	Phenol	108-95-2	**4,600,000.0**				710.00
Organic, Volatile							
	Acetone	67-64-1	NA			430.00	
	Benzene	71-43-2	**71.0**			2,400.00	2,300.00
	Ethylbenzene	100-41-4	**27,900.0**			240.00	350.00
	Toluene	108-88-3	**200,000.0**			850.00	740.00
	Total Xylenes	1330-20-7	NA			520.00	710.00

Note: NA = not available for this parameter

SK Services (East), L.C.

Table 3-6. Comparison of Detected Parameters For Shallow Zone Monitoring Well MW-129

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			470.00	830.00
	Oxidation Reduction Pot		NA			-62.30	-197.90
	pH		NA			6.71	6.81
	Specific Conductivity		NA			1.70	1.43
	Temperature		NA			15.30	15.84
	Turbidity		NA			1,251.40	0.70
General Chemistry							
	Alkalinity, Total		NA			380,000.00	320,000.00
	Carbon Dioxide		NA			668,000.00	435,000.00
	Chloride	16887-00-6	NA			260,000.00	200,000.00
	Cyanide, Total	57-12-5	NA			51.00	57.00
	Iron (Ferrous)	15438-31-0	NA			5,980.00	16,200.00
	Methane	74-82-8	NA			7,400.00	4,820.00
	Sulfate	14808-79-8	NA			2,100.00	11,000.00
Metals, Total							
	Calcium	7440-70-2	NA			140,000.00	130,000.00
	Iron	7439-89-6	NA			24,000.00	19,000.00
	Magnesium	7439-95-4	NA			27,000.00	23,000.00
	Manganese	7439-96-5	**100.0**			820.00	770.00
	Potassium	7440-09-7	NA			17,000.00	16,000.00
	Sodium	7440-23-5	NA			110,000.00	98,000.00
Organic, Semi-Volatile							
	Naphthalene	91-20-3	NA				15.00

Note: NA = not available for this parameter

Table 3-6. Comparison of Detected Parameters For Shallow Zone Monitoring Well MW-130

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			15,410.00	1,370.00
	Oxidation Reduction Pot		NA			-63.40	-87.40
	pH		NA			6.57	6.56
	Specific Conductivity		NA			3.70	4.72
	Temperature		NA			13.60	13.32
	Turbidity		NA			2.60	56.10
General Chemistry							
	Alkalinity, Total		NA			350,000.00	260,000.00
	Carbon Dioxide		NA			650,000.00	383,000.00
	Chloride	16887-00-6	NA			780,000.00	1,300,000.00
	Cyanide, Total	57-12-5	NA			57.00	45.00
	Iron (Ferrous)	15438-31-0	NA			66,700.00	74,500.00
	Methane	74-82-8	NA			8,400.00	4,360.00
	Sulfate	14808-79-8	NA			2,400.00	18,000.00
Metals, Total							
	Aluminum	7429-90-5	NA				910.00
	Barium	7440-39-3	NA			760.00	960.00
	Cadmium	7440-43-9	NA			8.30	
	Calcium	7440-70-2	NA			95,000.00	130,000.00
	Chromium	7440-47-3	**3,230.0**				24.00
	Copper	7440-50-8	NA			54.00	
	Iron	7439-89-6	NA			85,000.00	100,000.00
	Lead	7439-92-1	NA				23.00
	Magnesium	7439-95-4	NA			48,000.00	57,000.00
	Manganese	7439-96-5	**100.0**			1,100.00	1,100.00
	Potassium	7440-09-7	NA			25,000.00	42,000.00
	Sodium	7440-23-5	NA			440,000.00	700,000.00
	Zinc	7440-66-6	NA			24.00	
Organic, Semi-Volatile							
	Acenaphthene	83-32-9	NA			13.00	11.00

Note: NA = not available for this parameter

Table 3-6. Comparison of Detected Parameters For Shallow Zone Monitoring Well P-24

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			1,260.00	3,400.00
	Oxidation Reduction Pot		NA			-310.30	-287.10
	pH		NA			6.74	6.91
	Specific Conductivity		NA			2.80	3.09
	Temperature		NA			8.50	17.75
	Turbidity		NA			25.50	114.00
General Chemistry							
	Alkalinity, Total		NA			780,000.00	500,000.00
	Ammonia (as N)	7664-41-7	NA	19,000.00			
	Carbon Dioxide		NA			994,000.00	513,000.00
	Chloride	16887-00-6	NA	150,000.00		330,000.00	570,000.00
	Cyanide, Free	57-12-5	**1.0**				42.00
	Cyanide, Total	57-12-5	NA	3,800.00		150.00	560.00
	Iron (Ferrous)	15438-31-0	NA	4,970.00			401.00
	Methane	74-82-8	NA	6,075.33		9,500.00	3,130.00
	Nitrogen, Nitrite and Nit		NA			77.00	
	Solids, Total Dissolved		NA	1,200,000.00			
	Sulfate	14808-79-8	NA	32,000.00		55,000.00	170,000.00
Metals, Total							
	Aluminum	7429-90-5	NA	16,200.00			430.00
	Antimony	7440-36-0	**4,300.0**	17.20			
	Arsenic	7440-38-2	**0.136**	53.30			
	Barium	7440-39-3	NA	103.00			
	Beryllium	7440-41-7	NA	0.50			
	Cadmium	7440-43-9	NA	0.52			
	Calcium	7440-70-2	NA	171,000.00		180,000.00	270,000.00
	Chromium	7440-47-3	**3,230.0**	130.00			25.00
	Cobalt	7440-48-4	NA	8.72			
	Copper	7440-50-8	NA	1,700.00			
	Iron	7439-89-6	NA	48,900.00		1,000.00	1,200.00
	Lead	7439-92-1	NA	424.00			34.00
	Magnesium	7439-95-4	NA	74,200.00		60,000.00	70,000.00
	Manganese	7439-96-5	**100.0**	1,710.00		260.00	1,100.00
	Mercury	7439-97-6	**0.146**	3.74		0.24	0.30
	Nickel	7440-02-0	**3,900.0**	96.80			
	Potassium	7440-09-7	NA	15,700.00		16,000.00	17,000.00
	Selenium	7782-49-2	NA	17.50			
	Silver	7440-22-4	NA	0.47			
	Sodium	7440-23-5	NA	198,000.00		240,000.00	300,000.00
	Thallium	7440-28-0	**6.22**	3.27			
	Vanadium	7440-62-2	NA	58.30			
	Zinc	7440-66-6	NA	744.00			300.00
Organic, Semi-Volatile							
	2,4-Dimethylphenol	105-67-9	NA	2.90			
	2-Methylnaphthalene	91-57-6	NA	160.00			
	Acenaphthene	83-32-9	NA	56.00			86.00
	Acenaphthylene	208-96-8	NA	20.00			

Note: NA = not available for this parameter

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
	Anthracene	120-12-7	**108,000.0**	4.60			
	Benzo(a)Anthracene	56-55-3	**0.031**	2.90			
	Benzo(a)Pyrene	50-32-8	**0.031**	1.60			
	Benzo(b)Fluoranthene	205-99-2	NA	2.50			
	Benzo(g,h,i)perylene	191-24-2	NA	0.78			
	Benzo(k)Fluoranthene	207-08-9	**0.031**	0.73			
	Bis(2-Ethylhexyl) Phthal	117-81-7	**5.92**	0.66			
	Carbazole	86-74-8	NA	6.10			12.00
	Chrysene	218-01-9	**0.031**	2.70			
	Dibenzofuran	132-64-9	NA	40.00			50.00
	Fluoranthene	206-44-0	**393.0**	7.80			
	Fluorene	86-73-7	NA	19.00			25.00
	Indeno(1,2,3-c,d)pyrene	193-39-5	**0.031**	0.79			
	Naphthalene	91-20-3	NA	240.00		910.00	130.00
	Phenanthrene	85-01-8	NA	15.00			14.00
	Pyrene	129-00-0	**8,970.0**	7.40			
Organic, Volatile							
	Benzene	71-43-2	**71.0**	480.00		940.00	160.00
	Carbon Disulfide	75-15-0	NA	85.00			
	Ethylbenzene	100-41-4	**27,900.0**	150.00		160.00	120.00
	Methylene chloride	75-09-2	**1,600.0**	2.70			
	Toluene	108-88-3	**200,000.0**	20.00		61.00	
	Total Xylenes	1330-20-7	NA	71.00		110.00	24.00

Note: NA = not available for this parameter

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Table 3-6. Comparison of Detected Parameters For Shallow Zone Monitoring Well P-25A

Parameter Type	Parameter Name	CAS #	NJ Class SE-2 SWQC (ug/L)	1997Q3	1998Q2	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			3,550.00	800.00
	Oxidation Reduction Pot		NA			-25.90	-12.90
	pH		NA			6.62	6.69
	Specific Conductivity		NA			0.82	0.78
	Temperature		NA			13.50	9.59
	Turbidity		NA			0.00	0.60
General Chemistry							
	Alkalinity, Total		NA			260,000.00	150,000.00
	Carbon Dioxide		NA			310,000.00	174,000.00
	Chloride	16887-00-6	NA			60,000.00	66,000.00
	Cyanide, Total	57-12-5	NA			17.00	12.00
	Iron (Ferrous)	15438-31-0	NA			1,320.00	1,980.00
	Methane	74-82-8	NA			545.00	125.00
	Sulfate	14808-79-8	NA			57,000.00	46,000.00
Metals, Total							
	Calcium	7440-70-2	NA			68,000.00	55,000.00
	Iron	7439-89-6	NA			3,400.00	3,800.00
	Magnesium	7439-95-4	NA			30,000.00	24,000.00
	Manganese	7439-96-5	**100.0**			670.00	480.00
	Potassium	7440-09-7	NA			11,000.00	5,700.00
	Sodium	7440-23-5	NA			39,000.00	42,000.00

Note: NA = not available for this parameter

TABLE 3-7
DEEP ZONE GROUNDWATER ELEVATION DATA
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Date:			1/7/99		1/22/99		2/4/99		2/19/99	
Well ID	TOC Elev. (ft-msl)	Ref.	Depth to Water (ft-toc)	Groundwater Elevation (ft-	Depth to Water (ft-toc)	Groundwater Elevation (ft-	Depth to Water (ft-toc)	Groundwater Elevation (ft-	Depth to Water (ft-toc)	Groundwater Elevation (ft-
C-3	16.81	2	10.53	6.28	10.39	6.42	10.91	5.90	10.54	6.27
SWW-6.5	8.38	2	3.25	5.13	2.58	5.80	2.53	5.85	2.41	5.97
SWW-7.5	9.03	2	6.21	2.82	8.53	0.50	5.20	3.83	6.41	2.62
SWW-9	9.37	2	4.32	5.05	4.56	4.81	3.25	6.12	4.51	4.86
W-13R	6.68	1	1.47	5.21	1.02	5.66	1.11	5.57	2.13	4.55
W-17	6.61	2	3.20	3.41	2.68	3.93	2.16	4.45	4.51	2.10
W-25	9.85	2	5.13	4.72	4.70	5.15	4.33	5.52	6.11	3.74
W-29	12.01	2	8.52	3.49	8.53	3.48	7.58	4.43	8.01	4.00
W-30R	9.48	2	6.11	3.37	5.85	3.63	5.45	4.03	5.61	3.87
W-31	7.72	2	9.66	3.06*	9.21	3.51*	8.86	3.86*	9.98	2.74*

NOTES: 1) Surveyed by Casey & Keller, January 1998
2) Surveyed by Casey & Keller, August-September 1998
3) TOC = top of casing
4) ft-toc = feet below top of casing
5) ft-msl = feet above mean sea level
6) NM = not measured
7) NI = well was not installed on measurement date
8) Monitoring wells SWW-6.5, SWW-7.5, and SWW-9 were refurbished before 8/20/98 gauging event
9) ** = well is pressurized / did not stabilize for an accurate reading

TABLE 3-7
DEEP ZONE GROUNDWATER ELEVATION DATA
QUARTERLY GROUNDWATER MONITORING REPORT
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Date:			3/2/99		3/18/99		3/23/99	
Well ID	TOC Elev. (ft-msl)	Ref.	Depth to Water (ft-toc)	Groundwater Elevation (ft-	Depth to Water (ft-toc)	Groundwater Elevation (ft-	Depth to Water (ft-toc)	Groundwater Elevation (ft-
C-3	16.81	2	10.44	6.37	10.54	6.27	14.58	2.23
SWW-6.5	8.38	2	2.53	5.85	2.79	5.59	2.72	5.66
SWW-7.5	9.03	2	7.40	1.63	5.44	3.59	6.40	2.63
SWW-9	9.37	2	4.86	4.51	3.59	5.78	4.49	4.88
W-13R	6.68	1	2.49	4.19	0.98	5.70	4.35	2.33
W-17	6.61	2	2.93	3.68	5.55	1.06	3.18	3.43
W-25	9.85	2	5.00	4.85	4.79	5.06	4.91	4.94
W-29	12.01	2	7.67	4.34	7.59	4.42	11.82	0.19
W-30R	9.48	2	5.59	3.89	5.64	3.84	5.78	3.70
W-31	7.72	2	9.15	3.57*	10.21	2.51*	10.08	2.64*

NOTES: 1) Surveyed by Casey & Keller, January 1998
2) Surveyed by Casey & Keller, August-September 1998
3) TOC = top of casing
4) ft-toc = feet below top of casing
5) ft-msl = feet above mean sea level
6) NM = not measured
7) NI = well was not installed on measurement date
8) Monitoring wells SWW-6.5, SWW-7.5, and SWW-9 were refurbished before 8/20/98 gauging event
9) ** = well is pressurized / did not stabilize for an accurate reading

TABLE 3-8. Summary of Deep Zone Monitoring Wells, 1st Quarter 1999

safety-kleen. SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater
Parameter Type : Field/General Chemistry Units : See Below

Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	Units	Well Location C-3	W-13R	W-17	W-25	W-29	W-30R	W-31
Chloride	16887-00-6	**250000**	mg/L	1700	930	1100	4700	3100	580	800
Cyanide, Free	57-12-5	**200**	ug/L	<10	<10	<10	<10	<10	<10	<10
Cyanide, Total	57-12-5	**NA**	ug/L	<10	<10	<10	<10	<10	<10	<10
Dissolved Oxygen (DO)		**NA**	mg/L	1.26	1.31	1.02	0.41	1.03	1.87	1.26
Oxidation Reduction Potential		**NA**	mV	-7.7	-127.8	-87.6	-115.6	-83.6	-64.2	-30.7
pH		**NA**	SU	7.27	11.99	7.57	6.87	6.92	7.65	7.3
Solids, Total Dissolved		**500000**	mg/L	8000	1500	1900	2500	4900	1000	1400
Specific Conductivity		**NA**	uS	4.403	7.235	6.231	26.59	8.674	2.19	5.604
Temperature		**NA**	degree C	13.92	12.2	12.46	13.23	9.97	14.01	12.3
Turbidity		**NA**	NTU	1787.6	479.9	38.8	35.6	1533.8	210.1	39

Note: NA = not available for this parameter.
Data Qualifiers: M = duplicate presicision not met.

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TABLE 3-8. Summary of Deep Zone Monitoring Wells, 1st Quarter 1999

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater

Parameter Type : Metals, Total Units : ug/L

Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	Well Location						
			C-3	W-13R	W-17	W-25	W-29	W-30R	W-31
Aluminum	7429-90-5	**NA**	280000	<200	1500	400	19000	310	1100
Antimony	7440-36-0	**20**	<60	<60	<60	<60	<60	<60	<60
Arsenic	7440-38-2	**8**	16	<10	<10	13	15	<10	<10
Barium	7440-39-3	**2000**	3100	820	390	3700	2400	290	560
Beryllium	7440-41-7	**20**	18	<5	<5	<5	<5	<5	<5
Cadmium	7440-43-9	**4**	<50M	<5	<5	<5	6.5	<5	<5
Calcium	7440-70-2	**NA**	1900000	220000	230000	310000	400000	190000	90000
Chromium	7440-47-3	**100**	<10	<10	<10	<10	<10	<10	<10
Cobalt	7440-48-4	**NA**	320	<50	<50	<50	<50	<50	<50
Copper	7440-50-8	**1000**	550	<25	<25	<25	51	<25	<25
Iron	7439-89-6	**300**	650000	<100	2500	18000	38000	610	1800
Lead	7439-92-1	**10**	15	<3	<3	<3	11	<3	<3
Magnesium	7439-95-4	**NA**	300000	<5000	60000	390000	180000	20000	46000
Manganese	7439-96-5	**50**	26000	<15	790	780	2500	340	1200
Mercury	7439-97-6	**2**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nickel	7440-02-0	**100**	490	<40	<40	<40	46	<40	<40
Potassium	7440-09-7	**NA**	53000	120000	9600	39000	26000	<5000	7900
Selenium	7782-49-2	**50**	<5	<5	<5	<5	<5	<5	<5
Silver	7440-22-4	**NA**	<10	<10	<10	<10	<10	<10	<10
Sodium	7440-23-5	**50000**	500000	410000	360000	2600000	1200000	190000	450000
Thallium	7440-28-0	**10**	<10	<10	<10	<10	<10	<10	<10
Vanadium	7440-62-2	**NA**	920	<50	<50	<50	55	<50	<50
Zinc	7440-66-6	**5000**	1900	72	<20	<20	130	<20	<20

Note: NA = not available for this parameter

Data Qualifiers: M = duplicate precision not met.

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TABLE 3-8. Summary of Deep Zone Monitoring Wells, 1st Quarter 1999

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater

Parameter Type : Organic, Semi-Volatile Units : ug/L

Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	Well Location						
			C-3	W-13R	W-17	W-25	W-29	W-30R	W-31
1,2,4-Trichlorobenzene	120-82-1	**9**	<10	<10	<10	<10	<10	<10	<10
1,2-Dichlorobenzene	95-50-1	**600**	<10	<10	<10	<10	<10	<10	<10
1,3-Dichlorobenzene	541-73-1	**600**	<10	<10	<10	<10	<10	<10	<10
1,4-Dichlorobenzene	106-46-7	**75**	<10	<10	<10	<10	<10	<10	<10
2,4,5-Trichlorophenol	95-95-4	**700**	<25	<25	<25	<25	<25	<25	<25
2,4,6-Trichlorophenol	88-06-2	**20**	<10	<10	<10	<10	<10	<10	<10
2,4-Dichlorophenol	120-83-2	**20**	<10	<10	<10	<10	<10	<10	<10
2,4-Dimethylphenol	105-67-9	**100**	<10	<10	<10	<10	<10	<10	<10
2,4-Dinitrophenol	51-28-5	**40**	<25	<25	<25	<25	<25	<25	<25
2,4-Dinitrotoluene	121-14-2	**10**	<10	<10	<10	<10	<10	<10	<10
2,6-Dinitrotoluene	606-20-2	**NA**	<10	<10	<10	<10	<10	<10	<10
2-Chloronaphthalene	91-58-7	**NA**	<10	<10	<10	<10	<10	<10	<10
2-Chlorophenol	95-57-8	**40**	<10	<10	<10	<10	<10	<10	<10
2-Methylnaphthalene	91-57-6	**100**	<10	<10	<10	<10	<10	<10	<10
2-Methylphenol	95-48-7	**NA**	<10	<10	<10	<10	<10	<10	<10
2-Nitroaniline	88-74-4	**NA**	<25	<25	<25	<25	<25	<25	<25
2-Nitrophenol	88-75-5	**NA**	<10	<10	<10	<10	<10	<10	<10
3,3'-Dichlorobenzidine	91-94-1	**NA**	<10	<10	<10	<10	<10	<10	<10
3-Nitroaniline	99-09-2	**NA**	<25	<25	<25	<25	<25	<25	<25
4,6-Dinitro-2-methylphenol	534-52-1	**NA**	<25	<25	<25	<25	<25	<25	<25
4-Bromophenyl phenyl ether	101-55-3	**NA**	<10	<10	<10	<10	<10	<10	<10
4-Chloro-3-Methylphenol	59-50-7	**NA**	<10	<10	<10	<10	<10	<10	<10
4-Chloroaniline	106-47-8	**NA**	<10	<10	<10	<10	<10	<10	<10
4-Chlorophenyl phenyl ether	7005-72-3	**NA**	<10	<10	<10	<10	<10	<10	<10
4-Methylphenol	106-44-5	**NA**	<10	<10	<10	<10	<10	<10	<10
4-Nitroaniline	100-01-6	**NA**	<25	<25	<25	<25	<25	<25	<25
4-Nitrophenol	100-02-7	**NA**	<25	<25	<25	<25	<25	<25	<25
Acenaphthene	83-32-9	**400**	<10	<10	<10	<10	19	<10	<10
Acenaphthylene	208-96-8	**NA**	<10	<10	<10	<10	<10	<10	<10
Anthracene	120-12-7	**2000**	<10	<10	<10	<10	<10	<10	<10
Benzo(a)Anthracene	56-55-3	**NA**	<10	<10	<10	<10	<10	<10	<10
Benzo(a)Pyrene	50-32-8	**NA**	<10	<10	<10	<10	<10	<10	<10
Benzo(b)Fluoranthene	205-99-2	**NA**	<10	<10	<10	<10	<10	<10	<10
Benzo(g,h,i)perylene	191-24-2	**NA**	<10	<10	<10	<10	<10	<10	<10
Benzo(k)Fluoranthene	207-08-9	**NA**	<10	<10	<10	<10	<10	<10	<10

Note: NA = not available for this parameter

Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportionalto dilution factor and may be exaggerated.

Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	Well Location						
			C-3	W-13R	W-17	W-25	W-29	W-30R	W-31
Bis(2-Chloroethoxy)Methane	111-91-1	**NA**	<10	<10	<10	<10	<10	<10	<10
Bis(2-Chloroethyl) Ether	111-44-4	**NA**	<10	<10	<10	<10	<10	<10	<10
Bis(2-Chloroisopropyl) Ether	108-60-1	**NA**	<10	<10	<10	<10	<10	<10	<10
Bis(2-Ethylhexyl) Phthalate	117-81-7	**30**	<10	<10	<10	<10	<10	<10	<10
Butyl Benzyl Phthalate	85-68-7	**100**	<10	<10	<10	<10	<10	<10	<10
Carbazole	86-74-8	**100**	<10	<10	<10	<10	<10	<10	<10
Chrysene	218-01-9	**NA**	<10	<10	<10	<10	<10	<10	<10
Di-N-Butyl phthalate	84-74-2	**NA**	<10	<10	<10	<10	<10	<10	<10
Di-N-Octyl phthalate	117-84-0	**NA**	<10	<10	<10	<10	<10	<10	<10
Dibenz(a,h)anthracene	53-70-3	**NA**	<10	<10	<10	<10	<10	<10	<10
Dibenzofuran	132-64-9	**100**	<10	<10	<10	<10	<10	<10	<10
Diethyl phthalate	84-66-2	**NA**	<10	<10	<10	<10	<10	<10	<10
Dimethyl phthalate	131-11-3	**NA**	<10	<10	<10	<10	<10	<10	<10
Fluoranthene	206-44-0	**300**	<10	<10	<10	<10	<10	<10	<10
Fluorene	86-73-7	**300**	<10	<10	<10	<10	<10	<10	<10
Hexachlorobenzene	118-74-1	**10**	<10	<10	<10	<10	<10	<10	<10
Hexachlorobutadiene	87-68-3	**1**	<10	<10	<10	<10	<10	<10	<10
Hexachlorocyclopentadiene	77-47-4	**50**	<10	<10	<10	<10	<10	<10	<10
Hexachloroethane	67-72-1	**10**	<10	<10	<10	<10	<10	<10	<10
Indeno(1,2,3-c,d)pyrene	193-39-5	**NA**	<10	<10	<10	<10	<10	<10	<10
Isophorone	78-59-1	**100**	<10	<10	<10	<10	<10	<10	<10
N-Nitroso-di-N-propylamine	621-64-7	**NA**	<10	<10	<10	<10	<10	<10	<10
N-Nitrosodiphenylamine	86-30-6	**20**	<10	<10	<10	<10	<10	<10	<10
Naphthalene	91-20-3	**100**	<10	11	<10	<10	<10	<10	<10
Nitrobenzene	98-95-3	**10**	<10	<10	<10	<10	<10	<10	<10
Pentachlorophenol	87-86-5	**1**	<25	<25	<25	<25	<25	<25	<25
Phenanthrene	85-01-8	**NA**	<10	<10	<10	<10	<10	<10	<10
Phenol	108-95-2	**4000**	<10	22	<10	<10	<10	<10	<10
Pyrene	129-00-0	**200**	<10	<10	<10	<10	<10	<10	<10

Note: NA = not available for this parameter
Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportionalto dilution factor and may be exaggerated.

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TABLE 3-8. Summary of Deep Zone Monitoring Wells, 1st Quarter 1999

SK Services (East), L.C.

Laboratory : SK (ENCOTEC) Matrix : Groundwater
Parameter Type : Organic, Volatile Units : ug/L

Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	Well Location						
			C-3	W-13R	W-17	W-25	W-29	W-30R	W-31
1,1,1-Trichloroethane	71-55-6	30	<10	<10	<10	<10	<10	<10	<10
1,1,2,2-Tetrachloroethane	79-34-5	2	<10	<10	<10	<10	<10	<10	<10
1,1,2-Trichloroethane	79-00-5	3	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethane	75-34-3	70	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	75-35-4	NA	<10	<10	<10	<10	<10	<10	<10
1,2-Dichloroethane	107-06-2	2	<10	<10	<10	<10	<10	<10	<10
1,2-Dichloropropane	78-87-5	1	<10	<10	<10	<10	<10	<10	<10
2-Butanone (MEK)	78-93-3	NA	<10	<10	<10	<10	<10	<10	<10
2-Hexanone	591-78-6	NA	<10	<10	<10	<10	<10	<10	<10
4-Methyl-2-Pentanone (MIBK)	108-10-1	NA	<10	<10	<10	<10	<10	<10	<10
Acetone	67-64-1	700	<10	<10	<10	<10	<10	<10	<10
Benzene	71-43-2	1	<10	<10	<10	<10	<10	<10	<10
Bromodichloromethane	75-27-4	1	<10	<10	<10	<10	<10	<10	<10
Bromoform	75-25-2	4	<10	<10	<10	<10	<10	<10	<10
Bromomethane	74-83-9	10	<10	<10	<10	<10	<10	<10	<10
Carbon Disulfide	75-15-0	NA	<10	<10	<10	<10	<10	<10	<10
Carbon tetrachloride	56-23-5	2	<10	<10	<10	<10	<10	<10	<10
Chlorobenzene	108-90-7	4	<10	<10	<10	<10	<10	<10	<10
Chloroethane	75-00-3	NA	<10	<10	<10	<10	<10	<10	<10
Chloroform	67-66-3	6	<10	<10	<10	<10	<10	<10	<10
Chloromethane	74-87-3	30	<10	<10	<10	<10	<10	<10	<10
cis-1,3-Dichloropropene	10061-01-5	NA	<10	<10	<10	<10	<10	<10	<10
Dibromochloromethane	124-48-1	10	<10	<10	<10	<10	<10	<10	<10
Ethylbenzene	100-41-4	700	<10	<10	<10	<10	<10	<10	<10
Methylene chloride	75-09-2	2	<10	<10	<10	<10	<10	<10	<10
Styrene	100-42-5	100	<10	<10	<10	<10	<10	<10	<10
Tetrachloroethene	127-18-4	1	<10	<10	<10	<10	<10	<10	<10
Toluene	108-88-3	1000	<10	<10	<10	<10	<10	<10	<10
total 1,2-Dichloroethene	540-59-0	NA	<10	<10	<10	<10	<10	<10	<10
Total Xylenes	1330-20-7	NA	<10	<10	<10	<10	<10	<10	<10
trans-1,3-Dichloropropene	10061-02-6	NA	<10	<10	<10	<10	<10	<10	<10
Trichloroethene	79-01-6	1	<10	<10	<10	<10	<10	<10	<10
Vinyl chloride	75-01-4	5	<10	<10	<10	<10	<10	<10	<10

Note: NA = not available for this parameter
Data Qualifiers: J = detected below detection limit, B = detected in method Blank, K = reported concentration is proportional to diolution factor and may be exaggerated..

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Table 3-9. Comparison of Detected Parameters For Deep Zone Compliance Well C-3

SK Services (East), L.C.

Parameter Type	Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	1997Q2	1998Q1	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			760.00	1,260.00
	Oxidation Reduction Pot		NA			-2.60	-7.70
	pH		NA			7.03	7.27
	Specific Conductivity		NA			5.60	4.40
	Temperature		NA			10.90	13.92
	Turbidity		NA			1,742.10	1,787.60
General Chemistry							
	Chloride	16887-00-6	**250,000.0**			1,800,000.00	1,700,000.00
	Solids, Total Dissolved		**500,000.0**			2,900,000.00	8,000,000.00
Metals, Total							
	Aluminum	7429-90-5	NA			680.00	280,000.00
	Arsenic	7440-38-2	**0.02**			19.00	16.00
	Barium	7440-39-3	**2,000.0**			3,200.00	3,100.00
	Beryllium	7440-41-7	**0.008**				18.00
	Calcium	7440-70-2	NA			270,000.00	1,900,000.00
	Cobalt	7440-48-4	NA				320.00
	Copper	7440-50-8	**1,000.0**				550.00
	Iron	7439-89-6	**300.0**			17,000.00	650,000.00
	Lead	7439-92-1	**5.0**				15.00
	Magnesium	7439-95-4	NA			360,000.00	300,000.00
	Manganese	7439-96-5	**50.0**				26,000.00
	Nickel	7440-02-0	**100.0**				490.00
	Potassium	7440-09-7	NA			38,000.00	53,000.00
	Sodium	7440-23-5	**50,000.0**			2,700,000.00	500,000.00
	Vanadium	7440-62-2	NA				920.00
	Zinc	7440-66-6	**5,000.0**				1,900.00

Note: NA = not available for this parameter

Table 3-9. Comparison of Detected Parameters For Deep Zone Compliance Well W-13R

Parameter Type	Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	1997Q2	1998Q1	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		**NA**			6,740.00	1,310.00
	Oxidation Reduction Pot		**NA**			-24.60	-127.80
	pH		**NA**			11.34	11.99
	Specific Conductivity		**NA**			3.90	7.24
	Temperature		**NA**			12.40	12.20
	Turbidity		**NA**			191.30	479.90
General Chemistry							
	Chloride	16887-00-6	**250,000.0**		670,000.00	780,000.00	930,000.00
	Cyanide, Total	57-12-5	**NA**			15.00	
	Solids, Total Dissolved		**500,000.0**		1,400,000.00	1,400,000.00	1,500,000.00
Metals, Total							
	Aluminum	7429-90-5	**NA**		1,650.00		
	Arsenic	7440-38-2	**0.02**		2.33		
	Barium	7440-39-3	**2,000.0**		512.00	770.00	820.00
	Beryllium	7440-41-7	**0.008**		0.32		
	Calcium	7440-70-2	**NA**		181,000.00	190,000.00	220,000.00
	Chromium	7440-47-3	**100.0**		15.60		
	Cobalt	7440-48-4	**NA**		1.93		
	Copper	7440-50-8	**1,000.0**		3.43		
	Iron	7439-89-6	**300.0**		2,120.00		
	Lead	7439-92-1	**5.0**		1.61	17.00	
	Magnesium	7439-95-4	**NA**		24,800.00		
	Manganese	7439-96-5	**50.0**		334.00		
	Nickel	7440-02-0	**100.0**		11.20		
	Potassium	7440-09-7	**NA**		13,500.00	120,000.00	120,000.00
	Sodium	7440-23-5	**50,000.0**		165,000.00	340,000.00	410,000.00
	Vanadium	7440-62-2	**NA**		6.52		
	Zinc	7440-66-6	**5,000.0**		8.69		72.00
Organic, Semi-Volatile							
	2-Methylnaphthalene	91-57-6	**100.0**		1.50		
	Acenaphthene	83-32-9	**400.0**		2.30		
	Bis(2-Ethylhexyl) Phthal	117-81-7	**3.0**		0.83		
	Di-N-Butyl phthalate	84-74-2	**NA**		3.70		
	Dibenzofuran	132-64-9	**100.0**		0.57		
	Fluorene	86-73-7	**300.0**		0.90		
	Naphthalene	91-20-3	**100.0**		15.00	10.00	11.00
	Phenanthrene	85-01-8	**NA**		0.66		
	Phenol	108-95-2	**4,000.0**			21.00	22.00
Organic, Volatile							
	Methylene chloride	75-09-2	**2.0**		3.00		

Note: NA = not available for this parameter

Table 3-9. Comparison of Detected Parameters For Deep Zone Compliance Well W-17

Parameter Type	Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	1997Q2	1998Q1	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			4,830.00	1,020.00
	Oxidation Reduction Pot		NA			86.30	-87.60
	pH		NA			7.03	7.57
	Specific Conductivity		NA			3.60	6.23
	Temperature		NA			13.45	12.46
	Turbidity		NA			3.80	38.80
General Chemistry							
	Chloride	16887-00-6	**250,000.0**	1,100,000.00		1,100,000.00	1,100,000.00
	Solids, Total Dissolved		**500,000.0**	2,800,000.00		1,900,000.00	1,900,000.00
Metals, Total							
	Aluminum	7429-90-5	NA				1,500.00
	Arsenic	7440-38-2	**0.02**	40.00			
	Barium	7440-39-3	**2,000.0**			310.00	390.00
	Beryllium	7440-41-7	**0.008**	3.61			
	Cadmium	7440-43-9	**4.0**	5.36			
	Calcium	7440-70-2	NA	1,732,000.00		250,000.00	230,000.00
	Chromium	7440-47-3	**100.0**	297.00			
	Cobalt	7440-48-4	NA	50.30			
	Copper	7440-50-8	**1,000.0**	154.00			
	Iron	7439-89-6	**300.0**			350.00	2,500.00
	Lead	7439-92-1	**5.0**	105.00		4.70	
	Magnesium	7439-95-4	NA			72,000.00	66,000.00
	Manganese	7439-96-5	**50.0**			880.00	790.00
	Mercury	7439-97-6	**2.0**	0.93			
	Nickel	7440-02-0	**100.0**	257.00			
	Potassium	7440-09-7	NA	23,500.00		8,400.00	9,600.00
	Selenium	7782-49-2	**50.0**	24.40			
	Sodium	7440-23-5	**50,000.0**			380,000.00	360,000.00
	Vanadium	7440-62-2	NA	80.80			
	Zinc	7440-66-6	**5,000.0**	241.00			

Note: NA = not available for this parameter

Table 3-9. Comparison of Detected Parameters For Deep Zone Compliance Well W-25

SK Services (East) L.C.

Parameter Type	Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	1997Q2	1998Q1	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			1,700.00	410.00
	Oxidation Reduction Pot		NA			-108.00	-115.60
	pH		NA			6.81	6.87
	Specific Conductivity		NA			14.80	26.59
	Temperature		NA			12.10	13.23
	Turbidity		NA			1,556.30	35.60
General Chemistry							
	Chloride	16887-00-6	**250,000.0**	2,700,000.00		5,100,000.00	4,700,000.00
	Solids, Total Dissolved		**500,000.0**	6,000,000.00		7,000,000.00	2,500,000.00
Metals, Total							
	Aluminum	7429-90-5	NA			62,000.00	400.00
	Arsenic	7440-38-2	**0.02**	5.11		16.00	13.00
	Barium	7440-39-3	**2,000.0**	7,230.00		1,600.00	3,700.00
	Beryllium	7440-41-7	**0.008**	0.55			
	Cadmium	7440-43-9	**4.0**	0.37		17.00	
	Calcium	7440-70-2	NA	414,000.00		2,500,000.00	310,000.00
	Chromium	7440-47-3	**100.0**	22.40			
	Cobalt	7440-48-4	NA			66.00	
	Copper	7440-50-8	**1,000.0**	9.65		200.00	
	Iron	7439-89-6	**300.0**	7,180.00		130,000.00	18,000.00
	Lead	7439-92-1	**5.0**	3.32			
	Magnesium	7439-95-4	NA	130,000.00		150,000.00	390,000.00
	Manganese	7439-96-5	**50.0**	2,560.00			780.00
	Nickel	7440-02-0	**100.0**	22.60		110.00	
	Potassium	7440-09-7	NA	22,600.00		16,000.00	39,000.00
	Selenium	7782-49-2	**50.0**	4.16			
	Sodium	7440-23-5	**50,000.0**	1,032,000.00		1,200,000.00	2,600,000.00
	Thallium	7440-28-0	**0.5**	2.78			
	Vanadium	7440-62-2	NA	8.95		180.00	
	Zinc	7440-66-6	**5,000.0**	26.10		270.00	
Organic, Semi-Volatile							
	Acenaphthene	83-32-9	**400.0**	2.00			

Note: NA = not available for this parameter

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Table 3-9. Comparison of Detected Parameters For Deep Zone Compliance Well W-29

SK Services (East), L.C.

Parameter Type	Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	1997Q2	1998Q1	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		**NA**			9,170.00	1,030.00
	Oxidation Reduction Pot		**NA**			-66.00	-83.60
	pH		**NA**			7.07	6.92
	Specific Conductivity		**NA**			8.00	8.67
	Temperature		**NA**			14.40	9.97
	Turbidity		**NA**			200.50	1,533.80
General Chemistry							
	Chloride	16887-00-6	**250,000.0**	1,700,000.00		2,400,000.00	3,100,000.00
	Cyanide, Total	57-12-5	**NA**			10.00	
	Solids, Total Dissolved		**500,000.0**	4,600,000.00		3,700,000.00	4,900,000.00
Metals, Total							
	Aluminum	7429-90-5	**NA**	23,400.00		2,200.00	19,000.00
	Antimony	7440-36-0	**2.0**	0.82			
	Arsenic	7440-38-2	**0.02**	15.30		11.00	15.00
	Barium	7440-39-3	**2,000.0**	1,450.00		2,000.00	2,400.00
	Beryllium	7440-41-7	**0.008**	2.10			
	Cadmium	7440-43-9	**4.0**	1.16			6.50
	Calcium	7440-70-2	**NA**	510,000.00		340,000.00	400,000.00
	Chromium	7440-47-3	**100.0**	40.30			
	Cobalt	7440-48-4	**NA**	23.30			
	Copper	7440-50-8	**1,000.0**	52.40			51.00
	Iron	7439-89-6	**300.0**	34,000.00		6,900.00	38,000.00
	Lead	7439-92-1	**5.0**	30.10		3.10	11.00
	Magnesium	7439-95-4	**NA**	88,100.00		130,000.00	180,000.00
	Manganese	7439-96-5	**50.0**	3,190.00			2,500.00
	Nickel	7440-02-0	**100.0**	52.30			46.00
	Potassium	7440-09-7	**NA**	24,000.00		20,000.00	26,000.00
	Selenium	7782-49-2	**50.0**	3.17			
	Sodium	7440-23-5	**50,000.0**	543,000.00		940,000.00	1,200,000.00
	Thallium	7440-28-0	**0.5**	3.86			
	Vanadium	7440-62-2	**NA**	92.70			55.00
	Zinc	7440-66-6	**5,000.0**	128.00			130.00
Organic, Semi-Volatile							
	2-Methylnaphthalene	91-57-6	**100.0**	3.20			
	Acenaphthene	83-32-9	**400.0**	29.00		28.00	19.00
	Anthracene	120-12-7	**2,000.0**	4.70			
	Benzo(a)Anthracene	56-55-3	**NA**	1.20			
	Benzo(k)Fluoranthene	207-08-9	**NA**	1.00			
	Carbazole	86-74-8	**100.0**			10.00	
	Dibenzofuran	132-64-9	**100.0**	18.00		16.00	
	Fluoranthene	206-44-0	**300.0**	7.70			
	Fluorene	86-73-7	**300.0**	19.00		17.00	
	Naphthalene	91-20-3	**100.0**			27.00	
	Phenanthrene	85-01-8	**NA**	2.50			
	Pyrene	129-00-0	**200.0**	5.90			
Organic, Volatile							
	Total Xylenes	1330-20-7	**NA**	2.40			

Note: NA = not available for this parameter

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Table 3-9. Comparison of Detected Parameters For Deep Zone Compliance Well W-30R

SK Services (East) L.C.

Parameter Type	Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	1997Q2	1998Q1	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			1,600.00	1,870.00
	Oxidation Reduction Pot		NA			51.10	-64.20
	pH		NA			7.11	7.65
	Specific Conductivity		NA			1.50	2.19
	Temperature		NA			13.97	14.01
	Turbidity		NA			59.60	210.10
General Chemistry							
	Chloride	16887-00-6	**250,000.0**			550,000.00	580,000.00
	Solids, Total Dissolved		**500,000.0**			920,000.00	1,000,000.00
Metals, Total							
	Aluminum	7429-90-5	NA			710.00	310.00
	Barium	7440-39-3	**2,000.0**			240.00	290.00
	Calcium	7440-70-2	NA			160,000.00	190,000.00
	Iron	7439-89-6	**300.0**			1,100.00	610.00
	Magnesium	7439-95-4	NA			17,000.00	20,000.00
	Manganese	7439-96-5	**50.0**				340.00
	Sodium	7440-23-5	**50,000.0**			180,000.00	190,000.00

Note: NA = not available for this parameter

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Table 3-9. Comparison of Detected Parameters For Deep Zone Compliance Well W-31

SK Services (East) L.C.

Parameter Type	Parameter Name	CAS #	NJ Class II-A GWQC (ug/L)	1997Q2	1998Q1	1998Q4	1999Q1
Field Parameter							
	Dissolved Oxygen (DO)		NA			8,820.00	1,260.00
	Oxidation Reduction Pot		NA			139.10	-30.70
	pH		NA			7.01	7.30
	Specific Conductivity		NA			2.80	5.60
	Temperature		NA			13.20	12.30
	Turbidity		NA			28.20	39.00
General Chemistry							
	Chloride	16887-00-6	**250,000.0**	850,000.00		800,000.00	800,000.00
	Solids, Total Dissolved		**500,000.0**	2,000,000.00		1,500,000.00	1,400,000.00
Metals, Total							
	Aluminum	7429-90-5	NA			540.00	1,100.00
	Arsenic	7440-38-2	**0.02**	2.44			
	Barium	7440-39-3	**2,000.0**			520.00	560.00
	Beryllium	7440-41-7	**0.008**	0.35			
	Cadmium	7440-43-9	**4.0**	0.24			
	Calcium	7440-70-2	NA	112,000.00		83,000.00	90,000.00
	Chromium	7440-47-3	**100.0**	6.42			
	Cobalt	7440-48-4	NA	6.44			
	Copper	7440-50-8	**1,000.0**	21.30			
	Iron	7439-89-6	**300.0**			1,000.00	1,800.00
	Lead	7439-92-1	**5.0**	5.72			
	Magnesium	7439-95-4	NA			40,000.00	46,000.00
	Manganese	7439-96-5	**50.0**				1,200.00
	Nickel	7440-02-0	**100.0**	11.70			
	Potassium	7440-09-7	NA	12,600.00		7,500.00	7,900.00
	Selenium	7782-49-2	**50.0**	3.36			
	Sodium	7440-23-5	**50,000.0**			440,000.00	450,000.00
	Thallium	7440-28-0	**0.5**	3.72			
	Vanadium	7440-62-2	NA	12.20			
	Zinc	7440-66-6	**5,000.0**	53.00			
Organic, Semi-Volatile							
	Bis(2-Ethylhexyl) Phthal	117-81-7	**3.0**	2.40			
	Butyl Benzyl Phthalate	85-68-7	**100.0**	1.60			

Note: NA = not available for this parameter

safety-kleen

Table 3-10 Summary of Field Duplicate Results

Parameter Name	MW-116	DUP	RPD	P-24	DUP	RPD
Acenaphthene	96.00	110.00	13.6%	86.00	87.00	1.2%
Acetone	26.00	23.00	12.2%			
Alkalinity, Total	200,000.00	210,000.00	4.9%	500,000.00	470,000.00	6.2%
Aluminum				430.00	360.00	17.7%
Barium	480.00	460.00	4.3%			
Benzene				160.00	170.00	6.1%
Calcium	84,000.00	84,000.00	0.0%	270,000.00	260,000.00	3.8%
Carbazole	180.00	180.00	0.0%	12.00	13.00	8.0%
Carbon Dioxide	360.00	315.00	13.3%	513.00	524.00	2.1%
Chloride	450.00	480.00	6.5%	570.00	560.00	1.8%
Chromium				25.00	25.00	0.0%
Cyanide, Free				< 10	42.00	123.1%
Cyanide, Total	26.00	28.00	7.4%	560.00	1,800.00	105.1%
Dibenzofuran				50.00	50.00	0.0%
Ethylbenzene				120.00	120.00	0.0%
Fluorene	52.00	59.00	12.6%	25.00	27.00	7.7%
Iron	63,000.00	63,000.00	0.0%	1,200.00	1,200.00	0.0%
Iron (Ferrous)	47.50	46.10	3.0%	0.40	0.31	24.3%
Lead				34.00	23.00	38.6%
Magnesium	37,000.00	36,000.00	2.7%	70,000.00	69,000.00	1.4%
Manganese	1,300.00	1,200.00	8.0%	1,100.00	1,100.00	0.0%
Mercury				0.30	< 0.20	40.0%
Methane	8.08	7.37	9.2%	3.13	3.00	4.2%
Naphthalene				130.00	140.00	7.4%
Phenanthrene	38.00	45.00	16.9%	14.00	15.00	6.9%
Potassium	14,000.00	14,000.00	0.0%	17,000.00	17,000.00	0.0%
Sodium	270,000.00	270,000.00	0.0%	300,000.00	290,000.00	3.4%
Sulfate	50,000.00	39,000.00	24.7%	170,000.00	180,000.00	5.7%
Total Xylenes				24.00	24.00	0.0%
Zinc	1,800.00	1,600.00	11.8%	300.00	290.00	3.4%

Table 5-1
IRM SYSTEM DOWN-TIME SUMMARY
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Down-Time Episode	Condition	Down-Time Start Date	Down-Time Stop Date	Down-Time (days)	Cumulative Down-Time (days)
1	Power outage	May 29, 1998	June 1, 1998	3	3
2	Power outage	June 17, 1998	June 22, 1998	5	8
3	Power outage	August 1, 1998	August 3, 1998	2	10
4	Power outage	August 11, 1998	August 12, 1998	1	11
5	Air line	August 12, 1998	August 13, 1998	1	12
6	IRM system modifications	August 24, 1998	September 2, 1998	9	21
7	Power outage	September 7, 1998	September 9, 1998	2	23
8	IRM conveyance line repair	September 12, 1998	September 22, 1998	10	33
9	IRM conveyance line repair	October 2, 1998	October 2, 1998	0.25	33.25
10	Power outage	October 5, 1998	October 5, 1998	0.25	33.5
11	Slurry wall construction	November 17, 1998	November 18, 1998	1	34.5
12	Electrical Repair	December 1, 1998	December 2, 1998	0.5	35
13	Piping Repair	December 2, 1998	December 3, 1998	0.75	35.75
14	Power outage	December 28, 1998	December 28, 1998	0.25	36
15	Power outage	December 30, 1998	December 30, 1998	0.25	36.25

D35

JDC 8/18/82

02NJ045

Facility Name: Koppers Company, Inc (Seaboard Plant)

Location: Fish House Rd, Kearny, Hudson Co, NJ

EPA Region: II

Person(s) in Charge of the Facility: Anthony Farro
Alphonse Iannuzzi

Name of Reviewer: Richard Katz Date: 7/31/82

General Description of the Facility:

(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)

Active site comprising over 300 acres covered with about 10 feet of oil, tars, and byproducts left from a now-defunct coal gasification operation. The site borders a river with obvious releases to both surface and groundwater. The company has no plans to clean the site and several NJDEP investigations are ongoing.

Scores: $S_M = 13.10$ ($S_{gw} = 6.12$ $S_{sw} = 21.82$ $S_a = 0$)

$S_{FE} =$

$S_{DC} =$

Figure 1

HRS COVER SHEET

BAD000005

932220186

GROUND WATER ROUTE WORK SHEET

Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 45	1	45	45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 3	2		6	
Net Precipitation	0 1 2 3	1		3	
Permeability of the Unsaturated Zone	0 1 2 3	1		3	
Physical State	0 1 2 3	1		3	
	Total Route Characteristics Score			15	
3 Containment	0 1 2 3	1		3	3.3
4 Waste Characteristics					3.4
Toxicity/Persistence	0 3 6 9 12 15 18	1	18	18 ✓	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1	8	8 ✓	
	Total Waste Characteristics Score		26	26	
5 Targets					3.5
Ground Water Use	0 1 2 3	3	3	9	
Distance to Nearest Well/Population Served	0 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
	Total Targets Score		3	49	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			3510	57,330	
7 Divide line 6 by 57,330 and multiply by 100	S_{gw} = 6.12				

932220187

SURFACE WATER ROUTE WORK SHEET

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section
1 Observed Release	0 45	1	45	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					4.2
Facility Slope and Intervening Terrain	0 1 2 3	1		3	
1-yr. 24-hr. Rainfall	0 1 2 3	1		3	
Distance to Nearest Surface Water	0 1 2 3	2		6	
Physical State	0 1 2 3	1		3	
	Total Route Characteristics Score			15	
3 Containment	0 1 2 3	1		3	4.3
4 Waste Characteristics					4.4
Toxicity/Persistence	0 3 6 9 12 15 18	1	18	18	✓
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1	8	8	✓
	Total Waste Characteristics Score		26	26	✓
5 Targets					4.5
Surface Water Use	0 1 2 3	3	6	9	
Distance to a Sensitive Environment	0 1 2 3	2	6	6	
Population Served/Distance to Water Intake Downstream	0 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
	Total Targets Score		12	55	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			14,040	64,350	
7 Divide line 6 by 64,350 and multiply by 100	S_{SW} = 21.82				

AIR ROUTE WORK SHEET

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section
1 Observed Release	0 45	1		45	5.1
Date and Location: 7/28/82 on site					
Sampling Protocol: PID					
If line 1 is 0, the S = 0. Enter on line 5. If line 1 is 45, then proceed to line 2.					
2 Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 3	1		3	
Toxicity	0 1 2 3	3		9	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
	Total Waste Characteristics Score			20	
3 Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
Distance to Sensitive Environment	0 1 2 3	2		6	
Land Use	0 1 2 3	1		3	
	Total Targets Score			39	
4 Multiply 1 x 2 x 3				35,100	
5 Divide line 4 by 35,100 and multiply by 100 S_a = 0					

932220189

	S	S^2
Groundwater Route Score (S_{gw})	6.12	37.45
Surface Water Route Score (S_{sw})	21.82	476.11
Air Route Score (S_a)	0	0
$S^2_{gw} + S^2_{sw} + S^2_a$		513.56
$\sqrt{S^2_{gw} + S^2_{sw} + S^2_a}$		22.66
$\sqrt{S^2_{gw} + S^2_{sw} + S^2_a} / 1.73$		S_M = 13.1

WORKSHEET FOR COMPUTING S_M

FIRE AND EXPLOSION WORK SHEET

Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Containment	1 3	1		3	7.1
2 Waste Characteristics					7.2
Direct Evidence	0 3	1		3	
Ignitability	0 1 2 3	1		3	
Reactivity	0 1 2 3	1		3	
Incompatibility	0 1 2 3	1		3	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
	Total Waste Characteristics Score			20	
3 Targets					7.3
Distance to Nearest Population	0 1 2 3 4 5	1		5	
Distance to Nearest Building	0 1 2 3	1		3	
Distance to Sensitive Environment	0 1 2 3	1		3	
Land Use	0 1 2 3	1		3	
Population Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Buildings Within 2-Mile Radius	0 1 2 3 4 5	1		5	
	Total Targets Score			24	
4 Multiply 1 x 2 x 3				1,440	
5 Divide line 5 by 1,440 and multiply by 100 S_{FE} =					

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DIRECT CONTACT WORK SHEET

	Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section
1	Observed Incident	0 45	1		45	8.1
	If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2	Accessibility	0 1 2 3	1		3	8.2
3	Containment	0 15	1		15	8.3
4	Waste Characteristics Toxicity	0 1 2 3	5		15	8.4
5	Targets					8.5
	Population Within a 1-Mile Radius	0 1 2 3 4 5	4		20	
	Distance to a Critical Habitat	0 1 2 3	4		12	
		Total Targets Score			32	
6	If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5				21,600	
7	Divide line 6 by 21,600 and multiply by 100	S_{DC} =				

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DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

INSTRUCTIONS: The purpose of these records is to provide a convenient way to prepare an auditable record of the data and documentation used to apply the Hazard Ranking System to a given facility. As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,230 drums plus 800 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference that will make the document used for a given data point easier to find. Include the location of the document and consider appending a copy of the relevant page(s) for ease in review.

FACILITY NAME: Koppers Company Inc. - Seaboard Plant

LOCATION: Fish house Rd. Kearny, NJ.

Koppers is an approximately 300 acre site that was once used for coal gassification and coke producing activities. The site is covered with approximately 10 feet deep of oils and tars throughout most of its area. It borders the Hackensack River where waste material has been noted seeping from the site into the river. Waste material in tanks is presently being processed into a usable fuel. There is no intended disposal or cleanup operations ~~sep~~ to be accomplished by Koppers for its dumped wastes on site.

GROUND WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected (5 maximum):

① phenol ⑤ phthalates
② cyanide
③ naphthalene
④ endrin

Rationale for attributing the contaminants to the facility:

Conestoga-Rovers & Associates 9-79 report ("Hydrogeologic done for Koppers, which includes analysis performed on ground water. DWR, Region I files.
Doc: → memo from Scott Anders (Geologist) to Peter Lynch, DWR Region I, dated 1-7-81 in DWR's files

2 ROUTE CHARACTERISTICS

Depth to Aquifer of Concern N/A

Name/description of aquifers(s) of concern:

Depth(s) from the ground surface to the highest seasonal level of the saturated zone [water table(s)] of the aquifer of concern:

Depth from the ground surface to the lowest point of waste disposal/ storage:

932220195

Net Precipitation N/A

Mean annual or seasonal precipitation (list months for seasonal):

Mean annual lake or seasonal evaporation (list months for seasonal):

Net precipitation (subtract the above figures):

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

Permeability associated with soil type:

Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

* * *

3 CONTAINMENT

Containment N/A

Method(s) of waste or leachate containment evaluated:

Method with highest score:

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

Endrin
cyanide
naphthalene

Compound with highest score:

Endrin

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

Site is approx. 300 acres ~~and~~ covered with approx. 10 feet of Koppers by-products in several areas. Therefore, waste quantity is > 2500 yd3. Information was

Basis of estimating and/or computing waste quantity:

supplied by Tom Brady, own (601) 984-7874 via telephone on 7-22-72. Brady has been on site several times.

Total approx. = 20,000 yd3

* * *

5 TARGETS

Ground Water Use

Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:

Industrial process water use. Source: From "Water Well Inventory in the Vicinity of The Koppers Company, Inc. TAR Plant Seaboard, NJ." 7-81 by Geraghty & Miller, Inc. This document is in the DWR. Region I files.

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

On site wells operated by Koppers Co. for industrial use only. Source: "Water Well Inventory" as stated in above responce.

Distance to above well or building:

Population Served by Ground Water Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

None

Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

None

Total population served by ground water within a 3-mile radius:

None

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1 OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

Cyanide
phenols
creosote

observed continual releases of by-pr
to the Hacensack River. by the Coast
Guard (3-4-81 memo to Koppers in DWR file.
~~and~~ several DWR memo's, 11-13-81 letter

Rationale for attributing the contaminants to the facility: Coast Guard fro

7-81 Conestoga-Rovers & Associates hydrogeologic investigation.
in DWR Region I. files. (lab analysis).
Memos and letters in DWR Region I files.

* * *

2 ROUTE CHARACTERISTICS

N/A

Facility Slope and Intervening Terrain

Average slope of facility in percent:

Name/description of nearest downslope surface water:

Average slope of terrain between facility and above-cited surface water body in percent:

Is the facility located either totally or partially in surface water?

Is the facility completely surrounded by areas of higher elevation?

1-Year 24-Hour Rainfall in Inches

Distance to Nearest Downslope Surface Water

Physical State of Waste

* * *

3 CONTAINMENT

Containment N/A

Method(s) of waste or leachate containment evaluated:

Method with highest score:

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated

Cyanide
Phenol
Creosote
Endrin

Compound with highest score:

Endrin

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

Total approx. 20,000 yd^3 see P. 4

Basis of estimating and/or computing waste quantity:

site is approx. 300 acres ~~and~~ covered with approx. 10 feet of Koppers by-products in several areas (tars, oils, etc). This information was supplied by Tom Brady, DWM (609-984-7874) on 7-22-82. B. has inspected the site several *** times.

5 TARGETS

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

Industrial process water and recreational use.

Public Service E&G - cooling water; Source: DWR, Region I Water allocations permit.
citizens noted crabbing and boating in river during site inspect.

932220201

Is there tidal influence?

Yes

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

N/A

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

Site is located on fresh-water wetland
Source: Letter from Scott Andres (OWR Geologist) to Peter Lynch, Region I, Enforcement 1-7-81 in OWR, Region I files.

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less: N/A

Population Served by Surface Water

Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

None

932220202

Computation of land area irrigated by above-cited intake(s) and conversion to population (1.5 people per acre):

N/A

Total population served:

N/A

Name/description of nearest of above water bodies:

Hackensack River

Distance to above-cited intakes, measured in stream miles.

N/A.

AIR ROUTE

1 OBSERVED RELEASE

Contaminants detected:

None — PID measurements indicated levels that were not significantly over background.

Date and location of detection of contaminants

Methods used to detect the contaminants:

Rationale for attributing the contaminants to the site:

* * *

2 WASTE CHARACTERISTICS N/A

Reactivity and Incompatibility

Most reactive compound:

Most incompatible pair of compounds:

Toxicity

Most toxic compound:

Hazardous Waste Quantity

Total quantity of hazardous waste:

Basis of estimating and/or computing waste quantity:

* * *

3 TARGETS · W/A

Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi   0 to 1 mi   0 to 1/2 mi   0 to 1/4 mi

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

Distance to critical habitat of an endangered species, if 1 mile or less:

Land Use N/A

Distance to commercial/industrial area, if 1 mile or less:

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

Distance to residential area, if 2 miles or less:

Distance to agricultural land in production within past 5 years, if 1 mile or less:

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

Is a historic or landmark site (National Register or Historic Places and National Natural Landmarks) within the view of the site?

Koppers Co Inc/Seaboard Plant
NJD002445112
Site Status Update - Current Sept. 15, 2000
Prepared by Kristin Dobinson

The Koppers Co Inc/Seaboard Plant (Koppers) is located in Kearny, Hudson County, NJ. The site is an approximately 300-acre facility that was used for coal gasification and coke producing activities during the years 1950-1979. The site is covered with oils and tar throughout most of the site at depths of up to 10-20 feet. It borders the Hackensack River where waste seepage into the River has been observed. Waste materials also exist on site in tanks which is processed into usable fuel.

DEP site inspection indicates a groundwater investigation at the site was performed by a consultant in September 1979. The report indicated heavy soil and groundwater contamination of phenols, cyanide, naphthalene, phthalates, and endrin. Creosote components were also found in sediment samples taken from the Hackensack. Based upon this report, the DEP recommended groundwater monitoring and onsite containment. It was also recommended that the Department of Corrections delay purchasing this site until Koppers produced a clean up plan.

In December 1980, an abatement plan was requested by the US Coast Guard to address oil seepage from the site into the Hackensack River.

In April 1981, the site was visited by the Coast Guard and two areas of heavy seepage had been observed and were not being contained by the sorbent boom that had been deployed in the River. An abatement plan with a work plan was again requested.

The site was discovered by EPA on June 1, 1981.

A Preliminary Assessment was performed July 1, 1981.

A Site Inspection was performed by the NJ DEP and submitted to the EPA August 1, 1982.

An HRS score was calculated August 1, 1982.

A Site Inspection Prioritization was canceled in December of 1992 and the site was deferred to the NJ DEP.

Info from DEP Case Manager Trish Conti 609-633-1478:
Ongoing pump and treat gw remediation continuing until next year (approx.) at which time remediation will change to onsite containment via a slurry wall. DEP receives quarterly gw monitoring reports. Soil remediation will involve capping once contract issues with COE are resolved. Ongoing litigation between current site owner, Hudson County Improvement Authority, and Safety Kleen who is conducting remediation efforts. Third parties have expressed interest in developing the site into a pilot study for dredge spoils treatment which would then be

used as capping material. Proposal will probably be approved by DEP as long as plan does not interfere with current remedial plan and an oversight reimbursement plan for DEP can be arranged. Plan will not be approved until litigation is resolved. Removal of contaminated sediments in Hackensack River will be conducted in conjunction with dredging pilot, if approved.

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Diamond Alkali Co.
Newark Bay Study Area

NJD980528996

THIS DOCUMENT "**Koppers Company Evidence – Waste Disposal Site Survey Report, October 1979**" IS CURRENTLY CLASSIFIED AS NON-CONFIDENTIAL BY EPA.

Amelia Wagner
Amelia Wagner
Office of Regional Counsel

11/21/06
Date

932220209A

96th Congress 1st Session | COMMITTEE PRINT | COMMITTEE PRINT 96-IFC 33

WASTE DISPOSAL SITE SURVEY

REPORT

together with

ADDITIONAL AND SEPARATE VIEWS

BY THE

SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS

OF THE

COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE

HOUSE OF REPRESENTATIVES

NINETY-SIXTH CONGRESS

FIRST SESSION

OCTOBER 1979

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LETTER OF TRANSMITTAL

October 15, 1979

Honorable Harley O. Staggers
Chairman
Committee on Interstate and Foreign Commerce
Washington, D.C. 20515

Dear Mr. Chairman:

The attached report of the Subcommittee on Oversight and Investigations sets forth the results, findings, conclusions and recommendations relating to the Subcommittee's survey of process waste disposal practices of the 53 largest domestic chemical companies. This survey was conducted in conjunction with the Subcommittee's year-long investigation of disposal problems, the results of which are contained in the Subcommittee's recently released report entitled, "Hazardous Waste Disposal".

During the course of the Subcommittee's investigation, it became clear that millions of tons of toxic wastes are disposed in an environmentally unsound manner, resulting in "ticking time bombs" which pose hazards to public health and the environment. Facing a paucity of information on the location and content of sites containing hazardous wastes, the Subcommittee conducted its own limited survey--the first national study of waste disposal sites--to begin to determine in a systematic manner, the number, nature and location of all waste disposal sites across the country. The largest chemical manufacturers were selected for the survey, not to single that industry out, but rather, because the chemical industry as a whole produces some of the most toxic wastes, even though by volume it is not the single largest generator of hazardous wastes each year

The survey reveals that since 1950 the 53 companies, operating 1605 facilities, dumped wastes at 3,383 sites. Although only 34 percent of the sites were owned by the companies, 94 percent of the wastes were dumped in on-site facilities. During this thirty year period, the 53 generators produced 762 million tons of chemical process wastes of which 100 million tons went to sites which are now closed. In 1978 alone, 66 million tons were generated. The survey does not reveal what percentage of these wastes is hazardous.

APPENDIX B

THE 53 PARTICIPATING COMPANIES

Air Products
Allied Chemical
American Cyanamid
Ashland Oil
Atlantic Richfield
Borden
Borg-Warner
Celanese
CF Industries
Chevron
Cities Service
Diamond Shamrock
Dow Chemical
Dow Corning
DuPont
Eastman-Kodak
Esmark
Ethyl
Exxon
Farmland Industries
FMC Corporation
General Electric
B. F. Goodrich
Goodyear
W. R. Grace
Gulf Oil
Hercules
IMC Corporation
Kerr-McGee
Koppers
Lubrizol
Mobil
Monsanto
Nalco
National Distillers
NL Industries
Occidental Petroleum
Olin Corporation
Pennwalt
Pfizer
Phillips Petroleum
PPG Industries
Reichhold Chemical
Rohm and Haas
Shell Oil
Standard Oil (Ind.)
Stauffer
Tenneco
Texaco
Union Carbide
Union Oil (Cal.)
U.S. Steel
Williams Companies

APPENDIX C

(Identical letter sent to the 53 participating companies.)

CONGRESS OF THE UNITED STATES,
HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS OF THE
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
Washington, D.C., April 18, 1979.

DEAR MR. ——— ———.: The Subcommittee on Oversight and Investigations, under Rules X and XI of the House of Representatives, is conducting an investigation into problems associated with the disposal of industrial waste materials. The Subcommittee's inquiry will include an examination of the performance of the Environmental Protection Agency, in implementing the Resource Conservation and Recovery Act of 1976, and a determination of whether additional legislation is needed to address these problems.

The Subcommittee's investigation has disclosed that some disposal practices of the past, which appear to be questionable in the light of present day knowledge, have raised increasing concerns among certain sectors of the public, industry and government. The potential for adverse health and environmental effects from these practices are most acute where dump sites are abandoned or inactive, and their locations are unknown to responsible authorities.

In an attempt to begin to identify such sites, the Subcommittee is requesting each of the 50 largest domestic chemical companies to contact all of their plants or facilities, and those of their subsidiaries and affiliates, to gather data on dump sites and on industrial waste disposal practices since 1950, and to report such data on the enclosed questionnaire forms. This effort is not to suggest that the chemical industry is solely responsible for the situation that exists, but the very nature of your industry is such that large quantities of potentially dangerous wastes are generated. Additionally, this is only the first step of an effort to conduct a comprehensive national survey.

I recognize that going back thirty years in company records will be a difficult and, in some instances, impossible task, merely because complete records may not exist. But where there are no records, I hope you will attempt, as thoroughly as possible, through interviews of long-time employees, to pinpoint former dump sites.

Moreover, I would ask that you not necessarily limit your search to the period since 1950. The chemical industry was a vital part of our war effort and it is conceivable, even understandable, that during that time of national emergency dumping of dangerous waste materials occurred in a manner most expeditious for the moment.

JERSEY CITY — MUNICIPAL SEWAGE TREATMENT PLT, ADDRESS UNRERTED

SITE IS NOT LOCATED ON PROPERTY OF CHEMICAL PLANT PARTICIPATINGN SURVEY, BUT IS KNOWN TO HAVE BEEN USED FOR DISPOSAL FROM 1976 TO 1979. AT TIME OF USE, SITE WASUBLICLY OWNED. SITE IS STILL BEING USED. CHEMICAL COMPONENTS OF WASTE DISPOSED AT THIS SITE INCDE ORGANICS, INORGANICS AND MISCELLANEOUS WASTE MATERIAL. METHODS OF DISPOSAL INCLUDE UNCATAGOIZED METHODS.

KEARNEY — INTERSTATE CONCENTRATING CO., ADDRESS UNREPORTD

SITE IS NOT LOCATED ON PROPERTY OF CHEMICAL PLANT PARTICIPATING IN SURVEY, BUT IS KNOWN TO HAVE BEEN USED FOR DISPOSAL FROM 1973 TO 1975. AT TIME OF USE, SITE WAS OWNED BY PRIVATE CONCERN OTHER THAN CHEMICAL COMPANY INCLUDED IN THIS SURVEY. SITE IS POSSIBLY OPEN ORCLOSED. CHEMICAL COMPONENTS OF WASTE DISPOSED AT THIS SITE INCLUDE HEAVY METALS AND TRACE METALS (ONDED ORGANICALLY AND INORGANICALLY). METHODS OF DISPOSAL ARE NOT KNOWN.

[illegible] — MODERN TRANSPORTATION, 75 JACOBUS AVENUE 0032

SITE IS NOT LOCATED ON PROPERTY OF CHEMICAL PLANT PARTICIPATINGIN SURVEY, BUT IS KNOWN TO HAVE BEEN USED FOR DISPOSAL DURING 1978. AT TIME OF USE, SITE WAS OWNED BY AN UNIDENTIFIED PARTY. SITE IS STILL BEING USED. CHEMICAL COMPONENTS OF WASTE DISPOSED AT THIS SITE INCLUDE ACID SOLUTIONS (WITH PH < 3). METHODS OF DISPOSAL INCLUDE TREATMENT (EG.: NEUTRALIZATION) AND REPROCESSING AND/OR RECYCLING.

KEARNEY & ELIZABETH — SOUTH SIDE CARTING, ADDRESS UNREPORTED

SITE IS NOT LOCATED ON PROPERTY OF CHEMICAL PLANT PARTICIPATING IN SURVEY, BUT IS KNOWN TO HAVE BEEN USED FOR DISPOSAL IN 1967 AT EARLIEST. AT TIME OF USE, SITE WAS OWNED BY AN UNIDENTIFIED PARTY. SITE IS POSSIBLY OPEN OR CLOSED. CHEMICAL COMPONENTS OF WASTE DISPOSED AT THIS SITE INCLUDE HEAVY METALS AND TRACE METALS (BONDED ORGANICALLY AND INORGANICALLY), ORGANICS AND MISCELLANEOUS WASTE MATERIAL. METHODS OF DISPOSAL ARE NOT KNOWN.

KEARNY — CITY OF KEARNY DUMP, HARRISON AVENUE

SITE IS NOT LOCATED ON PROPERTY OF CHEMICAL PLANT PARTICIPATING IN SURVEY, BUT IS KNOWN TO HAVE BEEN USED FOR DISPOSAL FROM 1974 TO 1975. AT TIME OF USE, SITE WAS OWNED BY PRIVATE CONCERN OTHER THAN CHEMICAL COMPANY INCLUDED IN THIS SURVEY. SITE IS POSSIBLY OPEN OR CLOSED. CHEMICAL COMPONENTS OF WASTE DISPOSED AT THIS SITE INCLUDE BASE SOLUTIONS (WITH PH > 12) AND INORGANICS. METHODS OF DISPOSAL ARE NOT KNOWN.

KEARNY — EDGEWATER TERMINAL, 1401 HARRISON TURNPIKE 07032

SITE IS NOT LOCATED ON PROPERTY OF CHEMICAL PLANT PARTICIPATING IN SURVEY, BUT IS KNOWN TO HAVE BEEN USED FOR DISPOSAL FROM 1973 TO 1979. AT TIME OF USE, SITE WAS OWNED BY PRIVATE CONCERN OTHER THAN CHEMICAL COMPANY INCLUDED IN THIS SURVEY. SITE IS STILL BEING USED. CHEMICAL COMPONENTS OF WASTE DISPOSED AT THIS SITE INCLUDE ORGANICS. METHODS OF DISPOSAL INCLUDE REPROCESSING AND/OR RECYCLING.

KEARNY — FRANKLIN PLASTICS CORP, 113 PASSAIC AVE 07032

SITE IS NOT LOCATED ON PROPERTY OF CHEMICAL PLANT PARTICIPATING IN SURVEY, BUT IS KNOWN TO HAVE BEEN USED FOR DISPOSAL FROM 1978 TO 1979. AT TIME OF USE, SITE WAS OWNED BY PRIVATE CONCERN OTHER THAN CHEMICAL COMPANY INCLUDED IN THIS SURVEY. SITE IS STILL BEING USED. CHEMICAL COMPONENTS OF WASTE DISPOSED AT THIS SITE INCLUDE HEAVY METALS AND TRACE METALS (BONDED ORGANICALLY AND INORGANICALLY), ORGANICS AND MISCELLANEOUS WASTE MATERIAL. METHODS OF DISPOSAL INCLUDE REPROCESSING AND/OR RECYCLING.

KEARNY — KEARNY DUMP, ADDRESS UNREPORTED

SITE IS NOT LOCATED ON PROPERTY OF CHEMICAL PLANT PARTICIPATING IN SURVEY, BUT IS KNOWN TO HAVE BEEN USED FOR DISPOSAL FROM 1969 TO 1979. AT TIME OF USE, SITE WAS PUBLICLY OWNED. SITE IS STILL BEING USED. CHEMICAL COMPONENTS OF WASTE DISPOSED AT THIS SITE INCLUDE HEAVY METALS AND TRACE METALS (BONDED ORGANICALLY AND INORGANICALLY), ORGANICS, INORGANICS AND MISCELLANEOUS WASTE MATERIAL. METHODS OF DISPOSAL INCLUDE MONO INDUSTRIAL WASTE LANDFILL, MIXED INDUSTRIAL WASTE LANDFILL, DRUMMED WASTE LANDFILL AND LANDFILL IN WHICH MUNICIPAL WASTE IS CO-DISPOSED.

KEARNY — KEARNY PLANT, 1027 BELLEVILLE TURNPIKE 07032

SITE IS LOCATED ON PROPERTY OF CHEMICAL PLANT PARTICIPATING IN SURVEY AND IS KNOWN TO HAVE BEEN USED FOR DISPOSAL FROM 1950 TO 1971. SITE IS NO LONGER IN USE. AMOUNT OF CHEMICAL PROCESS WASTE DISPOSED OF AT THIS SITE THROUGH 1978 WAS REPORTED AS [illegible] HUNDRED TONS. CHEMICAL COMPONENTS OF WASTE DISPOSED AT THIS SITE INCLUDE ACID SOLUTIONS (WITH PH < 3), HEAVY METALS AND TRACE METALS (BONDED ORGANICALLY AND INORGANICALLY) AND INORGANICS. METHODS OF DISPOSAL INCLUDE MIXED INDUSTRIAL WASTE LANDFILL AND TREATMENT (EG.: NEUTRALIZATION).

KEARNY — KOPPERS CO., INC., SEABOARD PL, HARRISON TURNPIKE 07032

SITE IS LOCATED ON PROPERTY OF CHEMICAL PLANT PARTICIPATING IN SURVEY AND IS KNOWN TO HAVE BEEN USED FOR DISPOSAL FROM 1950 TO 1979. SITE IS NO LONGER IN USE. AMOUNT OF CHEMICAL PROCESS WASTE DISPOSED OF AT THIS SITE WAS NOT REPORTED. CHEMICAL COMPONENTS OF WASTE DISPOSED AT THIS SITE INCLUDE ORGANICS. METHODS OF DISPOSAL INCLUDE MONO INDUSTRIAL WASTE LANDFILL AND INCINERATION.

KEARNY — MODERN TRANSPORTATION, 75 JACOBUS AVE 07032

SITE IS NOT LOCATED ON PROPERTY OF CHEMICAL PLANT PARTICIPATING IN SURVEY, BUT IS KNOWN TO HAVE BEEN USED FOR DISPOSAL FROM 1977 TO 1979. AT TIME OF USE, SITE WAS OWNED BY PRIVATE CONCERN OTHER THAN CHEMICAL COMPANY INCLUDED IN THIS SURVEY. SITE IS STILL BEING USED. CHEMICAL COMPONENTS OF WASTE DISPOSED AT THIS SITE INCLUDE ORGANICS. METHODS OF DISPOSAL INCLUDE TREATMENT (EG.: NEUTRALIZATION).

KEARNY — MODERN TRANSPORTATION CO., 75 JACOBUS AVE. 07032

SITE IS NOT LOCATED ON PROPERTY OF CHEMICAL PLANT PARTICIPATING IN SURVEY, BUT IS KNOWN TO HAVE BEEN USED FOR DISPOSAL DURING 1975. AT TIME OF USE, SITE WAS OWNED BY PRIVATE CONCERN OTHER THAN CHEMICAL COMPANY INCLUDED IN THIS SURVEY. SITE IS POSSIBLY OPEN OR CLOSED. CHEMICAL COMPONENTS OF WASTE DISPOSED AT THIS SITE INCLUDE ORGANICS. METHODS OF DISPOSAL ARE NOT KNOWN.

KEARNY — MUNICIPAL SANITARY LANDFILL AU, BELLVILLE PIKE

SITE IS NOT LOCATED ON PROPERTY OF CHEMICAL PLANT PARTICIPATING IN SURVEY, BUT IS KNOWN TO HAVE BEEN USED FOR DISPOSAL FROM 1960 TO 1979. AT TIME OF USE, SITE WAS OWNED BY PRIVATE CONCERN OTHER THAN CHEMICAL COMPANY INCLUDED IN THIS SURVEY. SITE IS STILL BEING USED. CHEMICAL COMPONENTS OF WASTE DISPOSED AT THIS SITE INCLUDE ACID SOLUTIONS (WITH PH < 3), BASE SOLUTIONS (WITH PH > 12), HEAVY METALS AND TRACE METALS (BONDED ORGANICALLY AND INORGANICALLY), ORGANICS, INORGANICS AND MISCELLANEOUS WASTE MATERIAL. METHODS OF DISPOSAL INCLUDE MIXED INDUSTRIAL WASTE LANDFILL AND LANDFILL IN WHICH MUNICIPAL WASTE IS CO-DISPOSED.

KENVIL — HERCULES SANITARY LANDFILL, HOWARD BOULEVARD 07847

SITE IS LOCATED ON PROPERTY OF CHEMICAL PLANT PARTICIPATING IN SURVEY AND IS KNOWN TO HAVE BEEN USED FOR DISPOSAL IN 1979 AT LATEST. SITE IS STILL BEING USED. AMOUNT OF CHEMICAL PROCESS WASTE DISPOSED OF AT THIS SITE WAS NOT REPORTED. CHEMICAL COMPONENTS OF WASTE DISPOSED AT THIS SITE INCLUDE MISCELLANEOUS WASTE MATERIAL. METHODS OF DISPOSAL INCLUDE MONO INDUSTRIAL WASTE LANDFILL, PITS, PONDS AND LAGOONS AND INCINERATION.

LAUREL SPRINGS — BLACKWOOD CARBON PRODUCTS CO, 121 FAIRMOUNT AVE 08021

SITE IS NOT LOCATED ON PROPERTY OF CHEMICAL PLANT PARTICIPATING IN SURVEY, BUT IS KNOWN TO HAVE BEEN USED FOR DISPOSAL FROM 1975 TO 1979. AT TIME OF USE, SITE WAS OWNED BY PRIVATE CONCERN OTHER THAN CHEMICAL COMPANY INCLUDED IN THIS SURVEY. SITE IS STILL BEING USED. CHEMICAL COMPONENTS OF WASTE DISPOSED AT THIS SITE INCLUDE ORGANICS. METHODS OF DISPOSAL INCLUDE REPROCESSING AND/OR RECYCLING.

LINDEN — BAYWAY CHEMICAL PLANT, 1400 PARK AVENUE 07036

SITE IS LOCATED ON PROPERTY OF CHEMICAL PLANT PARTICIPATING IN SURVEY AND IS KNOWN TO HAVE BEEN USED FOR DISPOSAL FROM 1938 TO 1979. SITE IS STILL BEING USED. AMOUNT OF CHEMICAL PROCESS WASTE DISPOSED OF AT THIS SITE THROUGH 1978 WAS REPORTED AS 221 HUNDRED TONS. CHEMICAL COMPONENTS OF WASTE DISPOSED AT THIS SITE INCLUDE HEAVY METALS AND TRACE METALS (BONDED ORGANICALLY AND INORGANICALLY), ORGANICS, INORGANICS AND MISCELLANEOUS WASTE MATERIAL. METHODS OF DISPOSAL INCLUDE MIXED INDUSTRIAL WASTE LANDFILL, LANDFILL IN WHICH MUNICIPAL WASTE IS CO-DISPOSED, LAND FARMING AND INCINERATION.

(1-8)
(DO NOT USE)

FORM B: DISPOSAL SITE INFORMATION

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

Company Name: Allied Chemical Corporation - specialty chemicals Div.
Facility Name: Elizabeth Works
Name of Site: Kearny Dump
Address of Site: ______
no. street

Kearny, New Jersey
city state zip code

Name of Owner (while used by facility): Hackensack Meadowland Development Commission
Address: 100 Meadowland Parkway
no. street

Secaucus, New Jersey 07094
city state zip code

Current Owner (if different from above): ______
Address: ______
no. street

______
city state zip code

1. Location (1= the property on which facility is located; 2= off-site) ..... [2] (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership) ..... [3] (11)
3. Current status (1= closed; 2= still in use; 9=don't know) ..... [2] (12)
   IF CLOSED, specify year closed ..... 19[-][-] (13-14)
4. Year first used for process waste from this facility ..... 19[6][9] (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) ..... 19[7][9] (17-18)
6. Total amount of process waste from this facility disposed at site:
   thousand gallons ..... [ ] (19-26)
   hundred tons ..(estimated)..... [6] (27-33)
   thousand cubic yards ..... [ ] (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)
   landfill, mono industrial waste ..... [1] (42)
   landfill, mixed industrial waste ..... [1] (43)
   landfill, drummed waste ..... [1] (44)
   landfill, municipal refuse co-disposed ..... [1] (45)
   pits/ponds/lagoons ..... [9] (46)
   deep well injection ..... [3] (47)
   land farming ..... [9] (48)
   incineration ..... [9] (49)
   treatment (eg. neutralizing) ..... [3] (50)
   reprocessing/recycling ..... [9] (51)
   other (specify) ______ ..... [-] (52)
8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) ..... [3] (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

932220214

FORM C: HAULER INFORMATION

(DO NOT USE) (1-5)

10

PROVIDE A COMPLETE LIST OF ALL FIRMS AND INDEPENDENT CONTRACTORS, INCLUDING THE COMPANY AND ITS AFFILIATES AND SUBSIDIARIES, USED TO REMOVE PROCESS WASTES FROM THIS FACILITY SINCE 1950.

Company Name: Allied Chemical Corporation - specialty chemicals Div.

Facility Name: Elizabeth Works

Name of Firm or Contractor	Address	ICC # (If Known)	Years Used
1) Allied Chemical Corporation	140 North Ave East Elizabeth NJ 07201		1976-1979
2) Jersey Central Railroad	Eliz. [illegible] Terminal 405 Division St, Elizabeth		1977-1979
3) Rollins - Purle	Po Box 2349 Wilmington, Del	unknown	1964-1971
4) Allied Chemical Corporation (Barge AC-5)	Columbia Rd, [illegible] Township, NJ	None	1960-1979
5) Modern Transportation Co	75 Jacobus Ave So. Kearny NJ 07032	unknown	1978-1979
6) Scientific Chemical Processing	411 Wilson Ave Newark, NJ 07105	~~unknown~~	1975-1978
7) Scientific Chemical Treatment, Inc	Scotch Plains, NJ	unknown	1964-1975
8) Quadrel Bros Trucking	1603 Hart St. Rahway, NJ	unknown	1977-1979
9) Elizabeth Disposal Co. (now Browning-Ferris Ind)	Division St. Elizabeth, NJ 07201	unknown	1957-1969
10) Newco Chemical Waste Systems	4626 Royal Ave. Niagara Falls, NY 14303	unknown	1979

FORM B: DISPOSAL SITE INFORMATION

[illegible] (1-8)
(DO NOT USE)

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

CONFIDENTIAL

Company Name: American Cyanamid Company
Facility Name: Warners Plant
Name of Site: Municipal Sanitary Landfill Authority
Address of Site: Bellville Pike
no. street

Kearny New Jersey
city state zip code

Name of Owner (while used by facility): Municipal Sanitary Landfill Authority
Address: Belleville Pike
no. street

Kearney N.J.
city state zip code

Current Owner (if different from above): ____________
Address: ____________
no. street

____
city state zip code

1. Location (1= the property on which facility is located; 2= off-site)..... 2 (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership) 3 (11)
3. Current status (1= closed; 2= still in use; 9=don't know) 2 (12)
   IF CLOSED, specify year closed .... 19__ (13-14)
4. Year first used for process waste from this facility 1960 (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) 1979 (17-18)
6. Total amount of process waste from this facility disposed at site:
   Unknown
   thousand gallons .... ________ (19-26)
   hundred tons 9999999 (27-33)
   thousand cubic yards .... ________ (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)

landfill, mono industrial waste	9	(42)
landfill, mixed industrial waste	1	(43)
landfill, drummed waste	9	(44)
landfill, municipal refuse co-disposed ...	1	(45)
pits/ponds/lagoons	9	(46)
deep well injection	9	(47)
land farming	9	(48)
incineration	9	(49)
treatment (eg. neutralizing)..............	9	(50)
reprocessing/recycling	9	(51)
other (specify) ____________....	9	(52)

8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) 9 (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

932220216

FORM B: DISPOSAL SITE INFORMATION

0 3 [illegible] [illegible] 5 0 0 [illegible] (1-8)
(DO NOT USE)

> COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

CONFIDENTIAL

Company Name: American Cyanamid Company
Facility Name: Warners Plant
Name of Site: Municipal Sanitary Landfill Authority
Address of Site: Bellville Pike
no. street

Kearny New Jersey
city state zip code

Name of Owner (while used by facility): Municipal Sanitary Landfill Authority
Address: Belleville Pike
no. street

Kearney N.J.
city state zip code

Current Owner (if different from above): ____________
Address: ____________
no. street

____
city state zip code

1. Location (1= the property on which facility is located; 2= off-site) ..... [2] (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership) ..... [3] (11)
3. Current status (1= closed; 2= still in use; 9=don't know) ..... [2] (12)
   IF CLOSED, specify year closed ..... 19[|] (13-14)
4. Year first used for process waste from this facility ..... 19[6|0] (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) ..... 19[7|9] (17-18)
6. Total amount of process waste from this facility disposed at site:
   Unknown
   thousand gallons ..... [~~| | | | | | | |~~] (19-26)
   hundred tons ..... [9|9|9|9|9|9|9] (27-33)
   thousand cubic yards ..... [~~| | | | | | | |~~] (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)

landfill, mono industrial waste	[9]	(42)
landfill, mixed industrial waste	[1]	(43)
landfill, drummed waste	[9]	(44)
landfill, municipal refuse co-disposed ...	[1]	(45)
pits/ponds/lagoons	[9]	(46)
deep well injection	[9]	(47)
land farming	[9]	(48)
incineration	[9]	(49)
treatment (eg. neutralizing)	[9]	(50)
reprocessing/recycling	[9]	(51)
other (specify) ____________	[9]	(52)

8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) ..... [9] (53)

> LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

932220217

932220218

(DO NOT USE) 29026

FORM A GENERAL FACILITY INFORMATION

Company Name: Celanese Chemical Company, Inc.

Facility Name: Newark, N. J. Chemical Terminal

Address: 354 Doremus Ave
No. Street

Newark, N. J. 7105
City State Zip Code

Name of Person Completing Form: J. H. Stafford

Position: Terminals Environmental Coordinator

Phone Number: (21) 5894000

1. Year Facility Opened 19 51 (10-11)
2. Primary SIC Code .... (12-15)
3. Estimate the total amounts of process wastes (excluding wastes sold for use) generated by this facility during 1978.

thousand gallons .... (16-24)

hundred tons 0 (25-32)

thousand cubic yards .... (33-41)

4. Estimate (in whole percents) how these process wastes generated in 1978 were disposed of:

in landfill 87 (42-44)

in pit/pond/lagoon .... (45-47)

in deep well .... (48-50)

incinerated 13 (51-53)

reprocessed/recycled .... (54-56)

evaporated .... (57-59)

unknown .... (60-62)

other (Specify) .... (63-65)

5. What is the total number of known sites (including disposal on the property where this facility is located as one site) that have been used for the disposal of process wastes from this facility since 1950? 4 (66-68)

COMPLETE ONE FORM "B" FOR EACH OF THE SITES

6. Have any of the process wastes generated at this facility been hauled (removed) from this facility for disposal? (Yes=1, no=2) 1 (69)

IF YES, COMPLETE FORM "C"

7. Do you know the disposal site locations of all of the process waste hauled from your facility since 1950? (Yes=1, no=2) 1 (70)

IF NO, COMPLETE ONE FORM "D" FOR EACH FIRM OR CONTRACTOR WHO TOOK WASTE TO AN UNKNOWN LOCATION

8. Specify the earliest year represented by information from company or facility records supplied on this and other forms 19 76 (71-72)

9. Specify the earliest year represented by information from employee 51 (73-74)

DS.L

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

Company Name: Celanese Chemical Company, Inc.
Facility Name: Newark, N. J. Chemical Terminal
Name of Site:
Address of Site: ~~354 Doremus Ave.~~
no. street

Newark, N. J. 07105
city state zip code

Name of Owner (while used by facility): Celanese Chemical Co., Inc.
Address: 375 Doremus Ave.
no. street

Newark, N. J. 07105
city state zip code

Current Owner (if different from above):
Address:
no. street

city state zip code

1. Location (1= the property on which facility is located; 2= off-site) .... [1] (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership) .... [1] (11)
3. Current status (1= closed; 2= still in use; 9=don't know) .... [1] (12)
   IF CLOSED, specify year closed .... 19[7][4] (13-14)
4. Year first used for process waste from this facility .... 19[6][6] (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) .... 19[7][4] (17-18)
6. Total amount of process waste from this facility disposed at site:
   thousand gallons .... [illegible] (19-26)
   hundred tons .... [illegible] (27-33)
   thousand cubic yards .... [illegible] (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)
   landfill, mono industrial waste .... [2] (42)
   landfill, mixed industrial waste .... [3] (43)
   landfill, drummed waste .... [3] (44)
   landfill, municipal refuse co-disposed .... [3] (45)
   pits/ponds/lagoons .... [3] (46)
   deep well injection .... [3] (47)
   land farming .... [3] (48)
   incineration .... [3] (49)
   treatment (eg. neutralizing) .... [2] (50)
   reprocessing/recycling .... [3] (51)
   other (specify) .... [ ] (52)
8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) .... [1] (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW:

D5.2

932220220

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

Company Name: Celanese Chemical Company, Inc.
Facility Name: Newark, N. J. Chemical Terminal
Name of Site:
Address of Site: ~~354 Doremus Ave.~~
no. street

Newark, N. J. 07105
city state zip code

Name of Owner (while used by facility): Celanese Chemical Co., Inc.
Address: 375 Doremus Ave.
no. street

Newark, N. J. 07105
city state zip code

Current Owner (if different from above):
Address:
no. street

city state zip code

1. Location (1= the property on which facility is located; 2= off-site) ..... [1] (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership) ..... [1] (11)
3. Current status (1= closed; 2= still in use; 9=don't know) ..... [1] (12)
   IF CLOSED, specify year closed ..... 19[7][4] (13-14)
4. Year first used for process waste from this facility ..... 19[6][6] (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) ..... 19[7][4] (17-18)
6. Total amount of process waste from this facility disposed at site:
   thousand gallons ..... [ ] (19-26)
   hundred tons ..... [6] (27-33)
   thousand cubic yards ..... [ ] (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)
   landfill, mono industrial waste ..... [2] (42)
   landfill, mixed industrial waste ..... [3] (43)
   landfill, drummed waste ..... [3] (44)
   landfill, municipal refuse co-disposed ..... [3] (45)
   pits/ponds/lagoons ..... [3] (46)
   deep well injection ..... [3] (47)
   land farming ..... [3] (48)
   incineration ..... [3] (49)
   treatment (eg. neutralizing) ..... [2] (50)
   reprocessing/recycling ..... [3] (51)
   other (specify) ..... [ ] (52)
8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) ..... [1] (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

D5.2

932220221

THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

Company Name: Kelm(?) the Chemical Company, Inc.
Facility Name: Newark, N. J. Chemical Terminal
Name of Site: Municipal Sanitary Landfill
Address of Site: ?? Doremus Ave.
no. street

Newark, N. J. 07105
city state zip code

Name of Owner (while used by facility): Municipal Sanitary Landfill
Address:
no. street

Kearny N. J.
city state zip code

Current Owner (if different from above):
Address:
no. street

city state zip code

1. Location (1= the property on which facility is located; 2= off-site) .... [2] (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership) .... [3] (11)
3. Current status (1= closed; 2= still in use; 9=don't know) .... [2] (12)
   IF CLOSED, specify year closed .... 19[ ] (13-14)
4. Year first used for process waste from this facility .... 19[6 6] (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) .... 19[7 4] (17-18)
6. Total amount of process waste from this facility disposed at site:
   thousand gallons .... [ ] (19-26)
   hundred tons .... [0] (27-33)
   thousand cubic yards .... [ ] (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)
   landfill, mono industrial waste .... [9] (42)
   landfill, mixed industrial waste .... [9] (43)
   landfill, drummed waste .... [1] (44)
   landfill, municipal refuse co-disposed .... [1] (45)
   pits/ponds/lagoons .... [3] (46)
   deep well injection .... [3] (47)
   land farming .... [3] (48)
   incineration .... [3] (49)
   treatment (eg. neutralizing) .... [3] (50)
   reprocessing/recycling .... [3] (51)
   other (specify) .... [ ] (52)
8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) .... [3] (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

Unknown

D5.4

FORM B CONTINUED ON SECOND PAGE [1] (80)

932220222

FORM C: HAULER INFORMATION

|0|9|0|2|6| (1-5)
(DO NOT USE)

(3)

PROVIDE A COMPLETE LIST OF ALL FIRMS AND INDEPENDENT CONTRACTORS, INCLUDING THE COMPANY AND ITS AFFILIATES AND SUBSIDIARIES, USED TO REMOVE PROCESS WASTES FROM THIS FACILITY SINCE 1950.

Company Name: Celanese Corporation
Division/Subsidiary Celanese Chemical Company, Inc.
Facility Name: Newark Terminal

Name of Firm or Contractor	Address	ICC # (If Known)	Years Used From	Years Used To
Coastal Services	22 River Street Braintree, Mass.	-	1976	1978
A-M Environmental	1301 Market St. Patterson, N. J.			1979
A. Stropak	Metuchen, N. J.			1979

B5.10

932220223

(DO NOT USE)
09013

FORM A: GENERAL FACILITY INFORMATION

Company Name: CELANESE CORPORATION
Division/Subsidiary STEIN, HALL & CO., INC.
Facility Name: CLIFTON PLANT

Address: 290 BRIGHTON ROAD
No. Street

CLIFTON N.J. 07012
City State Zip Code

Name of Person

Position:

Phone Number:

NOTICE: If the film image is less clear than this notice, it is due to the quality of the document.

1. Year Facility Opened 19 6 0 (10-11)

2. Primary SIC Code 2 8 9 1 (12-15)

3. Estimate the total amounts of process wastes (excluding wastes sold for use) generated by this facility during 1978. USE ONLY TONS IF POSSIBLE - right justify response

NOTE: These wastes are non-hazardous.

thousand gallons 0 (16-24)

hundred tons 1 (25-32)

thousand cubic yards 0 (33-41)

4. Estimate (in whole percents) how these process wastes generated in 1978 were disposed of:

in landfill 1 0 0 (42-44)

in pit/pond/lagoon 0 (45-47)

in deep well 0 (48-50)

incinerated 0 (51-53)

reprocessed/recycled 0 (54-56)

evaporated 0 (57-59)

unknown 0 (60-62)

other (Specify ________) 0 (63-65)

5. What is the total number of known sites (including disposal on the property where this facility is located as one site) that have been used for the disposal of process wastes from this facility since 1950? 2 (66-68)

COMPLETE ONE FORM "B" FOR EACH OF THE SITES

6. Have any of the process wastes generated at this facility been hauled (removed) from this facility for disposal? (Yes=1; no=2) 1 (69)

IF YES, COMPLETE FORM "C".

7. Do you know the disposal site locations of all of the process waste hauled from your facility since 1950? (Yes=1; no=2) 1 (70)

IF NO, COMPLETE ONE FORM "D" FOR EACH FIRM OR CONTRACTOR WHO TOOK WASTE TO AN UNKNOWN LOCATION

8. Specify the earliest year represented by information from company or facility records supplied on this and other forms 19 7 5 (71-72)

9. Specify the earliest year represented by information from employee knowledge supplied on this and other forms 19 6 0 (73-74)

CONFIDENTIAL

CONFIDENTIAL

C5.1

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

Company Name: CELANESE CORPORATION Division/Subsidiary: Stein, Hall & Co. Inc
Facility Name: Clifton Plant
Name of Site: Municipal Sanitary Landfill Authority
Address of Site: 600 BELLEVILLE TURNPIKE
no. street

KEARNEY N.J.
city state zip code

Name of Owner (while used by facility): City of Kearney
Address:
no. street

Kearney N.J.
city state zip code

Current Owner (if different from above): same
Address:
no. street

city state zip code

1. Location (1= the property on which facility is located; 2= off-site) ..... [2] (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership 9=don't know) ..... [3] (11)
3. Current status (1= closed; 2= still in use; 9=don't know) ..... [2] (12)
   IF CLOSED, specify year closed ..... 19[|] (13-14)
4. Year first used for process waste from this facility ..... 19[6|0] (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) ..... 19[7|9] (17-18)
6. Total amount of process waste from this facility disposed at site.
   USE TONS ONLY IF POSSIBLE: thousand gallons ..... [| | | | | | |] (19-26)
   Right justify response hundred tons ..... [| | | | | |5] (27-33)
   thousand cubic yards ..... [| | | | | | |] (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)
   - landfill, mono industrial waste ..... [3] (42)
   - landfill, mixed industrial waste ..... [3] (43)
   - landfill, drummed waste ..... [3] (44)
   - landfill, municipal refuse co-disposed ..... [1] (45)
   - pits/ponds/lagoons ..... [3] (46)
   - deep well injection ..... [3] (47)
   - land farming ..... [3] (48)
   - incineration ..... [3] (49)
   - treatment (eg. neutralizing) ..... [3] (50)
   - reprocessing/recycling ..... [3] (51)
   - other (specify) ..... [3] (52)
8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) ..... [3] (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

List of users requested from this site, but site refused to provide same

932220224

FINAL

|7|6|0|4|8| (1-5)
(DO NOT USE)

FORM A: GENERAL FACILITY INFORMATION

Company Name: E.I. DuPONT
Division/Subsidiary: CD&P
Facility Name: NEWARK PLANT

Address: 256 VANDERPOOL STREET
No. Street

NEWARK N.J. 07114
City State Zip Code

Name of Person

Position:

Phone Number:

NOTICE: If the film image is less clear than this notice, it is due to the quality of the document being filmed.

1. Year Facility Opened .... (Possibly earlier) .... 19 |1|8| (10-11)

2. Primary SIC Code .... |2|8|1|6| (12-15)

3. Estimate the total amounts of process wastes (excluding wastes sold for use) generated by this facility during 1978:
USE ONLY TONS IF POSSIBLE - right justify response

thousand gallons .... | | | | | | | | | | (16-24)

hundred tons .... | | | | | | | |7| (25-32)

thousand cubic yards .... | | | | | | | | | | (33-41)

4. Estimate (in whole percents) how these process wastes generated in 1978 were disposed of:

in landfill .... |1|0|0| (42-44)

in pit/pond/lagoon .... | | |0| (45-47)

in deep well .... | | |0| (48-50)

incinerated .... | | |0| (51-53)

reprocessed/recycled .... | | |0| (54-56)

evaporated .... | | |0| (57-59)

unknown .... | | |0| (60-62)

other (Specify ____________) .... | | |0| (63-65)

5. What is the total number of known sites (including disposal on the property where this facility is located as one site) that have been used for the disposal of process wastes from this facility since 1950? .... | | |2| (66-68)

COMPLETE ONE FORM "B" FOR EACH OF THE SITES

6. Have any of the process wastes generated at this facility been hauled (removed) from this facility for disposal? (Yes=1; no=2) .... |1| (69)

IF YES, COMPLETE FORM "C"

7. Do you know the disposal site locations of all of the process waste hauled from your facility since 1950? (Yes=1; no=2) .... |1| (70) *

IF NO, COMPLETE ONE FORM "D" FOR EACH FIRM OR CONTRACTOR WHO TOOK WASTE TO AN UNKNOWN LOCATION

8. Specify the earliest year represented by information from company or facility records supplied on this and other forms .... 19 |7|2| (71-72)

9. Specify the earliest year represented by information from employee knowledge supplied on this and other forms .... 19 |7|0| (73-74)

* For the period for which any records or recollections exist.

932220225

FINAL

|1|6|0|4|8|0|0|2| (1-8)
(DO NOT USE)

FORM B: DISPOSAL SITE INFORMATION

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

Company Name: E.I. DuPONT Division/Subsidiary: CD&P
Facility Name: NEWARK PLANT
Name of Site: P&M SANITATION
Address of Site: BLOCKS 177-183 HACKENSACK MEADOWLANDS
no. street
NORTH ARLINGTON, N.J
city state zip code

Name of Owner (while used by facility): P&M SANITATION
Address: P.O. BOX 37
no. street
NORTH ARLINGTON, N.J 07032
city state zip code

Current Owner (if different from above):
Address:
no. street

city state zip code

1. Location (1= the property on which facility is located; 2= off-site) 2 (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership 9=don't know) 2 (11)
3. Current status (1= closed; 2= still in use; 9=don't know) 2 (12)
IF CLOSED, specify year closed ..... 19__ (13-14)
4. Year first used for process waste from this facility 1970 (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) 1979 (17-18)
6. Total amount of process waste from this facility disposed at site:
USE TONS ONLY IF POSSIBLE: thousand gallons ..... (19-26)
Right justify response hundred tons 201 (27-33)
thousand cubic yards ..... (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)

landfill, mono industrial waste	9	(42)
landfill, mixed industrial waste	1	(43)
landfill, drummed waste	9	(44)
landfill, municipal refuse co-disposed	1	(45)
pits/ponds/lagoons	3	(46)
deep well injection	3	(47)
land farming	3	(48)
incineration	3	(49)
treatment (eg. neutralizing)	9	(50)
reprocessing/recycling	3	(51)
other (specify)	9	(52)

8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) 3 (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

8

932220226

PART II: DISPOSAL SITE INFORMATION (DATA DECK)

20003005

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

Company Name: Exxon Chemical Company USA An Operating Division of Exxon Chem. Division/Subsidiary A Division of Exxon Corporation

Facility Name: Bayway Chemical Plant

Name of Site: MSLA

Address of Site: Belleville Turnpike (no. / street)

Kearny (city) N.J. (state) 07032 (zip code)

Name of Owner (while used by facility): Municipal Sanitary Landfill Authority

Address: Belleville Turnpike (no. / street)

Kearny/N. Arlington (city) N.J. (state) (zip code)

Current Owner (if different from above):

Address: (no. / street)

(city) (state) (zip code)

1. Location (1= the property on which facility is located, 2= off-site) .... [2] (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership 9=don't know) .... [2] (11)
3. Current status (1= closed, 2= still in use, 9=don't know) .... [2] (12)
   IF CLOSED, specify year closed .... 19[ ] (13-14)
4. Year first used for process waste from this facility .... 19[7 8] (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) .... 19[7 9] (17-18)
6. Total amount of process waste from this facility disposed at site:
   USE TONS ONLY IF POSSIBLE: Right justify response:
   thousand gallons .... [ ] (19-26)
   hundred tons .... [16] (27-33)
   thousand cubic yards .... [ ] (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)

Answers provided are applicable to the methods used to handle the wastes from this Exxon Chemical Co. USA facility.

landfill, mono industrial waste	3	(42)
landfill, mixed industrial waste	1	(43)
landfill, drummed waste	3	(44)
landfill, municipal refuse co-disposed	1	(45)
pits/ponds/lagoons	3	(46)
deep well injection	3	(47)
land farming	3	(48)
incineration	3	(49)
treatment (eg. neutralizing)	3	(50)
reprocessing/recycling	3	(51)
other (specify)	3	(52)

8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others, 9=don't know) .... [3] (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW:

932220227

[illegible] INFORMATION

20003

PROVIDE A COMPLETE LIST OF ALL FIRMS AND INDEPENDENT CONTRACTORS, INCLUDING THE COMPANY AND ITS AFFILIATES AND SUBSIDIARIES, USED TO REMOVE PROCESS WASTES FROM THIS FACILITY SINCE 1950.

Company Name: Exxon Chemical Company USA
An Operating Division of Exxon Chemical Company
Division/Subsidiary: A Division of Exxon Corp.
Facility Name: Bayway Chemical Plant

Name of Firm or Contractor	Address	ICC # (If Known)	Years Used
BFI	Elizabeth, N. J.		1976 - present
SCA Chemical Waste Services	Model City, N. Y.		1976-1977
Hudson Refining Co.	Long Island City, N.Y.		1975-present
Baron Chemicals Inc.	666 Boesel Avenue Manville, N. J.		1968-1970
Surplus Chemical	239 Lexington Blvd. Clark, N. J.		1969-1970
Scientific Pollution Control Corp.	Saddle River, N. J.		1970
Scientific Inc.	Meadow Road, Edison		1968-1976

932220228

FORM [illegible] DISPOSAL SITE INFORMATION

[illegible] (1-8)
(DO NOT USE)

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

Company Name: Onyx Chemical Company
Div. Kewanee Ind. Inc., A Sub. of Gulf Oil Corp.

Facility Name: Onyx Chemical Company

Name of Site: Municipal Landfill

Address of Site: ______
no. street

Kearny, New Jersey
city state zip code

Name of Owner (while used by facility): Publicly owned

Address: ______
no. street

______
city state zip code

Current Owner (if different from above): ______

Address: ______
no. street

______
city state zip code

1. Location (1= the property on which facility is located; 2= off-site) ..... [2] (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership) ..... [3] (11)
3. Current status (1= closed; 2= still in use, 9=don't know) ..... [9] (12)
   IF CLOSED, specify year closed ..... 19[ ][ ] (13-14)
4. Year first used for process waste from this facility ..... 19[7][0] (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) ..... 19[7][5] (17-18)
6. Total amount of process waste from this facility disposed at site:
   thousand gallons ..... [ ][ ][ ][ ][ ][1][9][0] (19-26)
   hundred tons ..... [ ][ ][ ][ ][ ][ ][ ] (27-33)
   thousand cubic yards ..... [ ][ ][ ][ ][ ][ ][ ][ ] (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)
   landfill, mono industrial waste ..... [9] (42)
   landfill, mixed industrial waste ..... [9] (43)
   landfill, drummed waste ..... [9] (44)
   landfill, municipal refuse co-disposed ..... [2] (45)
   pits/ponds/lagoons ..... [9] (46)
   deep well injection ..... [9] (47)
   land farming ..... [9] (48)
   incineration ..... [9] (49)
   treatment (eg. neutralizing) ..... [9] (50)
   reprocessing/recycling ..... [9] (51)
   other (specify) ______ ..... [9] (52)
8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) ..... [9] (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

932220229

[illegible] INFORMATION

[illegible] (2)

> [illegible] A COMPLETE LIST OF ALL FIRMS AND INDEPENDENT CONTRACTORS, INCLUDING THE COMPANY AND ITS AFFILIATES AND SUBSIDIARIES, USED TO [illegible] PROCESS WASTES FROM THIS FACILITY SINCE [illegible]

Company Name: Onyx Chemical Company
Div. Kewanee Ind. Inc., - A Sub. of Gulf Oil Corp.

Facility Name: Onyx Chemical Company

Name of Firm or Contractor	Address	ICC # (If Known)	Years Used
S & W Waste Inc.	25 Delmar Road Jersey City, N. J. 07305		1970 - 1979
Stavalo Bros. Disposal	Jersey City, New Jersey		1963 - 1969

932220230

25047 (1-5)
(DO NOT USE)

FORM A: GENERAL FACILITY INFORMATION

Company Name: Apache Foam Products Co. Div. Kewanee Ind. Inc.
a subsidiary of Gulf Oil Corporation

Facility Name: APACHE FOAM PRODUCTS CO.

Address: 2025 East Linden Avenue
No. Street

Linden, New Jersey 07036
City State Zip Code

Name of Pe

Position:

Phone Numb

1. Year Facility Opened 19 6 9 (10-11)

2. Primary SIC Code 2 9 5 0 (12-15)

3. Estimate the total amounts of process wastes (excluding wastes sold for use) generated by this facility during 1978:

thousand gallons .... (16-24)

hundred tons .... (25-32)

thousand cubic yards 1 6 2 (33-41)

4. Estimate (in whole percents) how these process wastes generated in 1978 were disposed of:

in landfill 1 0 0 (42-44)

in pit/pond/lagoon .... (45-47)

in deep well .... (48-50)

incinerated .... (51-53)

reprocessed/recycled .... (54-56)

evaporated .... (57-59)

unknown .... (60-62)

other (Specify________________) .... (63-65)

5. What is the total number of known sites (including disposal on the property where this facility is located as one site) that have been used for the disposal of process wastes from this facility since 1950? 1 (66-68)

COMPLETE ONE FORM "B" FOR EACH OF THE SITES

6. Have any of the process wastes generated at this facility been hauled (removed) from this facility for disposal? (Yes=1; no=2) 1 (69)

IF YES, COMPLETE FORM "C"

7. Do you know the disposal site locations of all of the process waste hauled from your facility since 1950? (Yes=1; no=2) 1 (70)

IF NO, COMPLETE ONE FORM "D" FOR EACH FIRM OR CONTRACTOR WHO TOOK WASTE TO AN UNKNOWN LOCATION

8. Specify the earliest year represented by information from company or facility records supplied on this and other forms 19 6 9 (71-72)

9. Specify the earliest year represented by information from employee knowledge supplied on this and other forms 19 6 9 (73-74)

NOTICE: If the film image is less clear than this notice, it is due to the quality of the document

3 2 4 3 2 4 3 1 (1-8)
(DO NOT USE)

FORM B: DISPOSAL SITE INFORMATION

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

Company Name: Apache Foam Products Co. Div. Kewanee Ind. Inc. a subsidiary of Gulf Oil Corporation

Facility Name: APACHE FOAM PRODUCTS CO.

Name of Site: Municipal Sanitary Landfill

Address of Site: 600 Bellville Turnpike
no. street

Kearney New Jersey
city state zip code

Name of Owner (while used by facility): Municipal Sanitary Landfill

Address: 600 Bellville Turnpike
no. street

Kearney New Jersey
city state zip code

Current Owner (if different from above):

Address:
no. street

city state zip code

1. Location (1= the property on which facility is located; 2= off-site) 2 (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership) 2 (11)
3. Current status (1= closed; 2= still in use; 9=don't know) 2 (12)
   IF CLOSED, specify year closed .... 19 _ _ (13-14)
4. Year first used for process waste from this facility 19 6 9 (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) 19 7 9 (17-18)
6. Total amount of process waste from this facility disposed at site:
   thousand gallons .... (19-26)
   hundred tons .... (27-33)
   thousand cubic yards 5 0 0 0 0 (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)
   landfill, mono industrial waste 9 (42)
   landfill, mixed industrial waste 9 (43)
   landfill, drummed waste 9 (44)
   landfill, municipal refuse co-disposed 1 (45)
   pits/ponds/lagoons 9 (46)
   deep well injection 9 (47)
   land farming 9 (48)
   incineration 9 (49)
   treatment (eg. neutralizing) 9 (50)
   reprocessing/recycling 9 (51)
   other (specify) ____ 9 (52)
8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) 3 (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

932220232

FORM B: DISPOSAL SITE INFORMATION

(DO NOT USE)

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

Company Name: W.R. GRACE Division/Subsidiary CHEMED CORPORATI

Facility Name: DUBOIS CHEMICAL

Name of Site: Municipal Landfill

Address of Site: ____ (no. street)

Kearny NJ 07032 (city state zip code)

Name of Owner (while used by facility): unknown

Address: ____ (no. street)

____ (city state zip code)

Current Owner (if different from above): ____

Address: ____ (no. street)

____ (city state zip code)

1. Location (1= the property on which facility is located; 2= off-site) ..... [2] (10)
2. Ownership at time of use (1= company ownership; 2=private but not c... ownership) 3=public ownership 9=don't know) ..... [9] (11)
3. Current status (1= closed; 2= still in use; 9=don't know) ..... [2] (12)
   IF CLOSED, specify year closed ..... 19[ ] (13-14)
4. Year first used for process waste from this facility ..... 19[71] (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) ..... 19[79] (17-18)
6. Total amount of process waste from this facility disposed at site:
   USE TONS ONLY IF POSSIBLE: thousand gallons ..... [ ] (19-26)
   Right justify response: hundred tons ..... [2] (27-33)
   thousand cubic yards ..... [ ] (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)
   - landfill, mono industrial waste ..... [9] (42)
   - landfill, mixed industrial waste ..... [1] (43)
   - landfill, drummed waste ..... [9] (44)
   - landfill, municipal refuse co-disposed ..... [1] (45)
   - pits/ponds/lagoons ..... [9] (46)
   - deep well injection ..... [9] (47)
   - land farming ..... [9] (48)
   - incineration ..... [9] (49)
   - treatment (eg. neutralizing) ..... [9] (50)
   - reprocessing/recycling ..... [9] (51)
   - other (specify) ____ ..... [ ] (52)
8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) ..... [9] (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

932220233

PART C: HAULER INFORMATION

PROVIDE A SEPARATE LIST OF ALL HIRED AND INDEPENDENT OPERATORS, INCLUDING [illegible] AND THE ADDRESSES [illegible], USED TO HAUL [illegible] FROM THIS FACILITY SINCE 1950.

Company Name: W.R. GRACE

Division/Subsidiary: [illegible]

Facility Name: [illegible]

Name of Firm or Contractor	Address	ICC # (If Known)	Years Used
PALUZZI BROS.	P.O.BOX 223, RUTHERFORD, N. J.		1958 – 1972
MELLO PORTABLE SERVICE,	288 PATERSON PLANK RD. E.RUTHERFORD		1973 – PRESENT
MODERN TRANSPORTATION,	75 JACOBUS AVE. SO. KEARNY, N J		1978
NORTH PENN	VINCENTOWN, N.J.		1977

932220234

FINAL

[illegible] (1-8)
(DO NOT USE)

FORM B: DISPOSAL SITE INFORMATION

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

Company Name: Koppers Company, Inc. Division/Subsidiary Organic Materials Group
Facility Name: Seaboard, N. J.
Name of Site: Municipal Sanitary Landfill Authority, Inc.
Address of Site: Bellville Turnpike
no. street

Kearny, N. J. 07038
city state zip code

Name of Owner (while used by facility):
Address:
no. street

city state zip code

Current Owner (if different from above):
Address:
no. street

city state zip code

1. Location (1= the property on which facility is located; 2= off-site) 2 (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership 9=don't know) 2 (11)
3. Current status (1= closed; 2= still in use; 9=don't know) 2 (12)
   IF CLOSED, specify year closed ..... 19__ (13-14)
4. Year first used for process waste from this facility 1974 (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) ..... 19__ (17-18)
6. Total amount of process waste from this facility disposed at site: Unknown. See Form C.
   USE TONS ONLY IF POSSIBLE: thousand gallons ..... (19-26)
   Right justify response hundred tons ..... (27-33)
   thousand cubic yards ..... (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)

landfill, mono industrial waste	9	(42)
landfill, mixed industrial waste	9	(43)
landfill, drummed waste	9	(44)
landfill, municipal refuse co-disposed	1	(45)
pits/ponds/lagoons	9	(46)
deep well injection	9	(47)
land farming	9	(48)
incineration	9	(49)
treatment (eg. neutralizing)	9	(50)
reprocessing/recycling	9	(51)
other (specify)	9	(52)

8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) 9 (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

Note: Wastewater Disposal.

932220235

FINAL

FORM C: HAULER INFORMATION

(1-5) (DO NOT USE)

(5)

PROVIDE A COMPLETE LIST OF ALL FIRMS AND INDEPENDENT CONTRACTORS, INCLUDING THE COMPANY AND ITS AFFILIATES AND SUBSIDIARIES, USED TO REMOVE PROCESS WASTES FROM THIS FACILITY SINCE 1950.

Company Name: Koppers Company, Inc.
Division/Subsidiary: Organic Materials Group
Facility Name: Seaboard, Kearny, N. J.

Name of Firm or Contractor	Address	ICC # (If Known)	Years Used
(1.) Criterion Tank Cleaning & Disposal (Future Name - Gaess) See Below.	99 Park Ave., in Borough of Park Ridge, Bergen Co., N. J.		1972-73 (Wastewater)
(2.) Gaess Environmental (Earthline, SCA) (Chem-Trol Liquid Waste Div.) See Below.	253 River Drive, Passaic, N. J. 07055		1973-78 (Wastewater)
(3.) Newtown Refinery Corp. (Future Name - Hudson Oil Refinery)	37-80 Review Ave. Long Island City, N. Y. 11101		1978 (Wastewater)
(4.) Hudson Oil Refinery	163 River Rd. Edgewater, N. J. 07020		1979 (Wastewater)
(5.) P. Bagarozza, Inc.	63 Newark Street Newark, N. J.		1979 (Contaminated Ground)

We are reasonably sure that there are haulers and disposers who have not been included. However, our records are incomplete and we do not know who they are.

(1.) & (2.) Criterion Tank Cleaning & Disposal and Gaess Environmental were contracted from 1972 - 1978 to remove the plant waste water. They, in turn, made arrangements with the landfills of 1.) Kin-Buc, 2.) Municipal Sanitary Landfill of Kearny, and 3.) Sharkey's Disposal to dispose of the waste removed from the plant. The decision of where to dispose of the waste was made by the hauler. Koppers Company, Inc., Organic Materials Group cannot ascertain the distribution of the approximately 9,000,000 gallons of wastewater taken to Kin Buc, Municipal Landfill of Kearny and Sharkey's Disposal between 1972 - 1978.

CC: Region V and IX

PPG INDUSTRIES

PPG INDUSTRIES, INC. ONE GATEWAY CENTER PITTSBURGH, PENNSYLVANIA 15222/AREA 412/434-3703

PAUL M. KING, Senior Attorney

July 13, 1979

Dr. Anne Cohn
Subcommittee on Oversight and
Investigations
Committee on Interstate and Foreign
Commerce
2323 Rayburn House Office Building
U. S. Congress
Washington, Dc 20515

Re: Waste Disposal Site Survey

Dear Dr. Cohn:

In confirmation of our conversation of today and pursuant to the June 28, 1979, letter from Mr. V. A. Sarni to Congressman Bob Eckhardt, attached is the remaining material to be submitted by PPG Industries, Inc. in response to the waste disposal site survey.

Due to the fact that the attached forms relate to facilities which have been shut down for some period of time, the information for completion of many of the questions is not available. A statement regarding the efforts made by PPG to complete the questionnaires is attached for each facility.

As was the case with the materials previously submitted, this information is considered confidential by PPG and is submitted as such based upon Congressman Eckhardt's statements that it will not be disclosed except under extreme circumstances and then, only after notice to PPG.

If you have any questions with regard to this material, please call me.

Very truly yours,

Paul M. King

Paul M. King
Senior Attorney

PMK/mr

Attachments

FORM A: GENERAL FACILITY INFORMATION

NOT ON PRINT OUT

Company Name: PPG INDUSTRIES, INC

Facility Name: NEWARK FACTORY

Address: Riverside Ave
No. Street

Newark N.J.
City State Zip Code

Name of Person Completing Form: L.N. STREFF

Position: MGR. ENV. ENG. & CONTROL

Phone Number: (412) 274-4500

1. Year Facility Opened .... 19 |0|2| (10-11)

2. Primary SIC Code .... |2|8|5|1| (12-15)
2821

3. Estimate the total amounts of process wastes (excluding wastes sold for use) generated by this facility during 1978:

thousand gallons .... | | | | | | | | | | (16-24)

hundred tons .... | | | | | | | | | (25-32)

thousand cubic yards .... | | | | | | | | | | (33-41)

4. Estimate (in whole percents) how these process wastes generated in 1978 were disposed of:

in landfill .... | | | | (42-44)

in pit/pond/lagoon .... | | | | (45-47)

in deep well .... | | | | (48-50)

incinerated .... | | | | (51-53)

reprocessed/recycled .... | | | | (54-56)

evaporated .... | | | | (57-59)

unknown .... | | | | (60-62)

other (Specify____________________)......... | | | | (63-65)

5. What is the total number of known sites (including disposal on the property where this facility is located as one site) that have been used for the disposal of process wastes from this facility since 1950? .... |-|-| (66-68)

COMPLETE ONE FORM "B" FOR EACH OF THE SITES

6. Have any of the process wastes generated at this facility been hauled (removed) from this facility for disposal? (Yes=1; no=2) .... |1| (69)

IF YES, COMPLETE FORM "C"

7. Do you know the disposal site locations of all of the process waste hauled from your facility since 1950? (Yes=1; no=2) .... |2| (70)

IF NO, COMPLETE ONE FORM "D" FOR EACH FIRM OR CONTRACTOR WHO TOOK WASTE TO AN UNKNOWN LOCATION

8. Specify the earliest year represented by information from company or facility records supplied on this and other forms .... 19|-|-| (71-72)

9. Specify the earliest year represented by information from employee knowledge supplied on this and other forms .... 19|5|0| (73-74)

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FORM C: HAULER INFORMATION

PROVIDE A COMPLETE LIST OF ALL FIRMS AND INDEPENDENT CONTRACTORS, INCLUDING THE COMPANY AND ITS AFFILIATES AND SUBSIDIARIES, USED TO REMOVE PROCESS WASTES FROM THIS FACILITY SINCE 1950.

Company Name: PPG INDUSTRIES, INC

Facility Name: NEWARK FACTORY

Name of Firm or Contractor	Address	ICC # (If Known)	Years Used
ESSEX HAULING CO.			21

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[illegible] PROCESS WASTE FROM THIS FACILITY SINCE 1950 AND [illegible]
[illegible] LOCATION

Company Name: PPG INDUSTRIES, INC

Facility Name: NEWARK FACTORY

Name of Hauling Firm/Contractor: ESSEX HAULING Co.

Address: (no.) ______ (street) ______

(city) ______ (state) ______ (zip code) ______

PUT IN FILE

1. Year first used 19 5 0 (10-11)
2. Year last used (enter "78" if still in use) 19 7 1 (12-13)
3. Total amount of process waste hauled from this facility: UNKNOWN
   - thousand gallons .... | | | | | | | | | (14-21)
   - hundred tons.............. | | | | | | | | (22-28)
   - thousand cubic yards ...... | | | | | | | | | (29-36)
4. Components (or characteristics) of process waste from this facility disposed at site: (1=present in waste; 2=not present in waste; 9=don't know):
   FILL IN EVERY BLOCK SPACE

Acid solutions, with pH<3	2	(37)
pickling liquor	2	(38)
metal plating waste	2	(39)
circuit etchings	2	(40)
inorganic acid manufacture	2	(41)
organic acid manufacture	2	(42)
Base solutions, with pH>10	1	(43)
caustic soda manufacture	2	(44)
nylon and similar polymer generation	2	(45)
scrubber residual	2	(46)
Heavy metals & trace metals (bonded organically & inorganically)	1	(47)
arsenic, selenium, antimony	2	(48)
mercury	1	(49)
iron, manganese, magnesium	1	(50)
zinc, cadmium, copper, chromium (trivalent)	1	(51)
chromium (hexavalent)	9	(52)
lead	1	(53)
Radioactive residues, >3 pico curies/liter	2	(54)
uranium residuals & residuals for UF_6 recycling	2	(55)
lathanide series elements and rare earth salts	2	(56)
phosphate slag	2	(57)
thorium	2	(58)
radium	2	(59)
other alpha, beta & gamma emitters	2	(60)
Organics	1	(61)
pesticides & intermediates	2	(62)
herbicides & intermediates	2	(63)
fungicides & intermediates	2	(64)
rodenticides & intermediates	2	(65)
halogenated aliphatics	2	(66)
halogenated aromatics	2	(67)
acrylates & latex emulsions	1	(68)
PCB/PBB's	2	(69)
amides, amines, imides	1	(70)
plastizers	1	(71)
resins	1	(72)
elastomers	2	(73)
solvents protic (except water)	2	(74)
carbontetrachloride	2	(75)
trichloroethylene	2	(76)
other solvents nonprotic	2	(77)
solvents halogenated aliphatic	2	(78)
solvents halogenated aromatic	2	(79) 1 1
oils and oil sludges	1	(10)
esters and ethers	1	(11)
alcohols	1	(12)
ketones & aldehydes	1	(13)
dioxins	2	(14)
Inorganics	2	(15)
salts	2	(16)
mercaptans	2	(17)
Misc.	1	(18)
pharmaceutical wastes	2	(19)
paints & pigments	1	(20)
catalysts (eg. vanadium, platinum, palladium)	2	(21)
asbestos	2	(22)
[illegible]	2	[illegible]

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FACILITY

Newark Factory

CLOSURE DATE

1971

PERSONS CONTACTED

Shipping Supervisor

Wastes hauled from plant by Essex Hauling Company, Al Chicclese, owner. Essex located in Down Neck section of New Jersey. Wastes hauled to Kearney Dump at Kearney, New Jersey.

LAST FACTORY MANAGER

Wastes removed by Essex and hauled to Meadows near East Rutherford.

LAST PLANT ENGINEER

Some wastes dumped at sea by hauler.

D38

REMEDIAL ACTION REPORT AND PROGRESS REPORT

VOLUME I - TEXT, TABLES AND FIGURES

FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Prepared for:

Beazer East, Inc.

BAA000183

Prepared by:

Key Environmental, Inc.
1200 Arch Street, Suite 200
Carnegie, Pennsylvania 15106

October 2003

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- Permit 14, LURP - Waterfront Development Permit - 0907-97-0005.1, 11/26/97-11/26/02
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- March 1, 1999 (Week #4)
- March 8, 1999 (Week #5)
- March 15, 1999 (Week #6)
- March 30, 1999 (Week #7, #8)
- April 5, 1999 (Week #9)
- April 19, 1999 (Week #10, #11)
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Federal Hazardous Waste Report

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- July 2, 1998 Correspondence - SK Services to PS&S
- July 13, 1998 Correspondence - PS&S to SK Services
- July 16, 1998 Correspondence - SK Services to PS&S
- Geotechnical Testing and Inspection Reports (Matrix Environmental to SK Services)
- September 2, 1998 - Permeability Status Summary
- April 20, 1998 - Dredge Quarterly Report
- Miscellaneous Dredge Sediment Data
- October 9, 1998 Correspondence - IRL to PS&S
- October 20, 1998 - AUD Quarterly Report

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Weekly Status Reports

- July 26, 1998 (#1)
- August 2, 1998 (#2)
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- November 8, 1998 (#4)
- November 15, 1998 (#5)
- November 22, 1998 (#6)
- November 29, 1998 (#7)
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- December 13, 1998 (#9)

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Permeability Test Results - Summary Memo Dated 9/22/98

- 63 + 10 4-6'
- 71 + 10 7-9'
- 66 + 70 10-12'
- 75 + 00 5-7'
- 37 + 30 8-10', 18-20'
- 40 + 10 6-8', 12-14', 20-22'
- 44 + 65 4-6', 10-12'
- 49 + 10 5-7', 12-14'
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- December 23, 1998 PDM Key Progress Update
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ABBREVIATIONS/ACRONYMS

ACO	Administrative Consent Order
AOC	Area of Contamination
AUD	Acceptable Use Determination
Beazer	Beazer East, Inc.
bgs	Below Ground Surface
Brownfield Act	Brownfield and Contaminated Site Remediation Act, P.L. 1997 C. 278
CEA	Classification Exception Area
CEI	Conti Environmental, Inc.
CKD	Cement Kiln Dust
COI	Constituents of Interest
CT&E	CT&E Environmental Services, Inc.
CY	Cubic Yards
DER	Declaration of Environmental Restriction
DNAPL	Dense Non-Aqueous Phase Liquid
GWQC	Groundwater Quality Criteria
HCIA	Hudson County Improvement Authority
HMDC	Hackensack Meadowlands Development Commission
IC-RAWP	Institutional Controls-Remedial Action Work Plan
IRL	Investment Recovery, L.L.C.
IRM	Interim Remedial Measures
ISRA	Industrial Site Recovery Act
Koppers	Koppers Company, Inc.
LMS	Lawler, Matusky and Skelly Engineers, L.L.P.
LURP	Land Use Regulatory Program
MATRIX	Matrix Environmental & Geotechnical Services
MG	Million Gallons
MLW	Mean Low Water
MOU	Memorandum of Understanding between Beazer, NJDEP, ECDC and HCIA
MRCE	Mueser Rudledge Consulting Engineers
msl	Mean Sea Level
NJDEP	New Jersey Department of Environmental Protection
NJMC	New Jersey Meadowlands Commission (formerly HMDC)
NYD-ACOE	New York District Army Corps of Engineers
OSHA	Occupational Safety and Health Administration
PDM	Processed Dredge Material
psf	Pounds per Square Foot
PS&S	Paulus, Sokolowski & Sartor, Inc.
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
QC	Quality Control
RAO	Remedial Action Objective

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ABBREVIATIONS/ACRONYMS (Continued)

RAR and PR	Remedial Action Report and Progress Report
RASR	Remedial Action Selection Report
RAWP	Remedial Action Work Plan
RDM	Raw Dredged Material
RDCSCC	Residential Direct Contact Soil Cleanup Criteria
SK Services	SK Services, L.C. (East), formerly ECDC Environmental, L.C.
SSP	Steel Sheet Pile
TPA	Three Party Agreement
WAD	Weak-Acid-Dissociable

1.0 INTRODUCTION

This Remedial Action Report and Progress Report (RAR and PR) prepared on behalf of Beazer East, Inc. (Beazer) documents the remedial action activities planned and completed in accordance with the New Jersey Department of Environmental Protection (NJDEP) approved Remedial Action Work Plan (RAWP) at the Former Koppers Company, Inc. (Koppers) Seaboard Site located in the Town of Kearny, Hudson County, New Jersey. The remedial action activities were performed in accordance with a March 4, 1997 Memorandum of Understanding (MOU)[1] between the NJDEP, Beazer, SK Services (East), L.C. (SK Services)[2] and the Hudson County Improvement Authority (HCIA).

The Site is currently owned by the HCIA. The location of the Site is shown on Figure 1.

1.1 BACKGROUND

The Site, which is the location of a former coke and coke by-products facility, is being addressed in accordance with a March 1986 Administrative Consent Order (ACO) between Beazer (formerly known as Koppers Company, Inc.) and the NJDEP. In addition, the remediation is consistent with the New Jersey Industrial Site Recycling Act (ISRA), P.L. 1993, c. 139 (S-1070) and the Brownfield and Contaminated Site Remediation Act, P.L. 1997 C. 278 (Brownfield Act). The NJDEP has designated the Case No. NJD002445112 for the Site.

Remediation of the Site was, in part, to be accomplished utilizing processed dredge material (PDM) originating from the New York/New Jersey harbor as an engineering control. The plan to remediate the Site using PDM was outlined in a "White Paper"[3] and the MOU, which collectively identified the Remedial Action Objectives (RAOs) and proposed remedies for the Site. Additional requirements and specific roles for implementation of remedial and redevelopment activities at the Site were outlined in a Three Party Agreement[4] entered into between HCIA, SK Services and Beazer in February 1997. Finally, the parties prepared and submitted to the NJDEP a "Scoping Letter[5] that presented a detailed list of activities to be

---

[1] Beazer, March 4, 1997, Memorandum of Understanding Koppers Seaboard Site, between NJDEP, Beazer, ECDC and HCIA.

[2] Formerly ECDC Environmental, L.C.

[3] Beazer, November 27, 1996, "White Paper", Brownfield Redevelopment of Seaboard Utilizing Processed Dredged Material.

[4] Three Party Agreement, February 1997

[5] Key Environmental, June 2, 1997 Scoping Letter, Remedial Action Work Plan

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conducted to support the preparation of a Remedial Action Work Plan[6] (RAWP) for the remediation of the Site.

Following the execution of the MOU, the parties began implementing the RAWP, and today much of the required remediation has been completed at the Site. As will be discussed in detail in subsequent sections of this report, the approved RAWP included seven primary remedial components. These remedial components were: 1) the installation of barrier walls and the use of PDM as engineering controls, 2) excavation and on-Site consolidation of sediments; 3) on-Site stabilization and consolidation of waste materials; 4) recovery of Dense Non-Aqueous Phase Liquid (DNAPL); 5) groundwater natural attenuation; 6) off-Site disposal of the contents of a former storage tank; and 7) the implementation of institutional controls. Significant work has been done on over half of these remedial components, and the most significant of them have been completed. In addition, work requested by NJDEP to locate and close four suspected production wells was also completed. As a result of SK Services' bankruptcy, and its failure to win additional dredging contracts, some RAWP remedial components remain to be completed. Beazer, HCIA, SK, its bonding company and NJMC have recently worked out an agreement pursuant to which Beazer and HCIA will complete the remaining RAWP remedial components.

The objective of this RAR and PR is to identify, with supporting documentation, the RAWP actions completed to date, and to identify the remaining remediation activities necessary to satisfy the RAWP. As appropriate, additional Remedial Action Report(s) will be prepared upon completion of the remaining remediation activities.

Various parties have been involved in the development and implementation of the RAWP. The following is a listing of entities of which KEY is aware that have contributed to the completion of the RAWP work or that are otherwise involved in the project:

Three Party Agreement Participants

- SK Services (East), L.C.
- Beazer East, Inc.
- Hudson County Improvement Authority

Contractors/Consultants/Labs

- Key Environmental, Inc.
- Paulus, Sokolowski, and Sartor, Inc.
- PMK
- Dresdner Robin Environmental Management, Inc.
- Casey and Keller, Incorporated
- Matrix Environmental and Geotechnical Engineers
- Conti Environmental

6 Key Environmental, April 1998, Remedial Action Work Plan, Former Koppers Seaboard Site, Kearny, New Jersey

- Summit Drilling
- CT&E Environmental Services
- Warren George
- Environmental Decision Group
- Baker Oil Tools
- Aqua Sol
- Hydro Group
- Mueser Rutledge Consulting Engineers
- Woodward Clyde
- GEOD Corporation
- PSE&G
- Clean Ventures
- Severn Trent Laboratories
- Lawler, Matusky and Skelly Engineers
- ITEX
- Linde-Griffith Construction Company

Regulatory Agencies

- New Jersey Meadowlands Commission
- New Jersey Department of Environmental Protection
- Department of Army, New York District Corps of Engineers
- Hudson-Essex-Passaic Soil Conservation District

It is important to note that information contained in this RAR and PR compiles data, drawings, test results, surveys, and other information produced by many of the above entities. In development of this RAR and PR, KEY has assumed that all work that was performed pursuant to the Three Party Agreement is public information available for presentation in support of this RAR and PR.

1.2 DOCUMENT ORGANIZATION

This RAR and PR is organized into three volumes. Following this introductory section, Volume I of this RAR and PR is organized as follows:

Section 2.0 Summary of Remediation Requirements
Section 3.0 Remedial Action Activities
Section 4.0 Certifications

Volume II of the RAR and PR is comprised of:

- As-Built Drawings
- Site Construction Photographs

Volume III - Supporting Information of the RAR and PR is comprised of:

- RAWP Approval Letters
- Permits
- Production Well and Bedrock Well Supporting Information
- Monitoring Well Supporting Information
- Tank Decommissioning Reports
- Surface Cover Supporting Information
- Slurry Wall Supporting Information
- Steel Sheet Pile Wall Supporting Information
- PDM Key Supporting Information

2.0 SUMMARY OF REMEDIATION REQUIREMENTS

The following sections provide a summary of the remedial objectives for the Site, and the applicable permits/authorization/notices necessary to implement the remedial activities.

2.1 REMEDY SELECTION/REMEDIAL ACTION WORK PLAN

Because the overall remedy for the Site was set forth in the White Paper and MOU, a separate Remedial Action Selection Report (RASR) under N.J.A.C. 7:26E-5.2 was not required. However, Section 3.4 of the RAWP reviewed the criteria in support the selection of the remedial actions for the Site and generally satisfies the requirements of a RASR.

The parties completed the pre-design activities outlined in the Scoping Letter, and prepared and submitted the RAWP to the NJDEP in April 1998. The NJDEP provided conditional approval of the RAWP on May 8, 1998[7]. The conditional approval letter is provided in Volume III-A of the RAR and PR.

The NJDEP-approved RAWP established the remedial responses for the media of interest at the Site, which included soil, groundwater and DNAPL. Furthermore, it identified area-specific remedial responses for the Eastern, Central, and Western areas of the Site. A summary of the RAOs and remedial responses is provided in the following table:

TABLE 2-1
REMEDIAL ACTION OBJECTIVES AND REMEDIAL RESPONSE

Media	Remedial Action Objective	Remedial Response
Soil	Prevent Potential Exposure to Surface Soils.	Placement of at least 2 feet or more of low permeability (1×10^{-6} cm/sec) structural fill meeting NJDEP non-residential direct contact soil cleanup criteria and owner soil placement criteria consistent with the goal of maintaining a low permeability surface cover over the entire Site and restricting exposure to contaminated soils. Maintain a Declaration of Environmental Restriction (DER) and associated institutional controls for the Site, executed by the land owner, with the appropriate governing bodies.

7 NJDEP, May 8, 1998, Remedial Action Work Plan Approval Letter

TABLE 2-1 REMEDIAL ACTION OBJECTIVES AND REMEDIAL RESPONSE		
Media	**Remedial Action Objective**	**Remedial Response**
Groundwater	Mitigate potential migration of dissolved-phase constituents of interest (COI) to applicable surface water standards (SE-2) prior to discharge to the Hackensack River. Mitigate potential vertical migration of Site-related dissolved-phase COI exceeding Class II-A Groundwater Quality Standards to lower aquifers beneath the Site.	A physical hydraulic barrier will be constructed along the Site perimeter with the Hackensack River. Natural attenuation including performance monitoring of the shallow water bearing zone. Classification Exception Area (CEA) for shallow groundwater above Class II-A groundwater standards. Implementation of the deep groundwater monitoring and contingency plan, if necessary.
DNAPL	Prevent potential horizontal DNAPL migration to the Hackensack River Prevent potential vertical DNAPL migration to deeper zones.	A physical hydraulic barrier will be constructed along the Site perimeter with the Hackensack River. A comprehensive monitoring plan to evaluate both the potential presence of DNAPL and elevated levels of Site-related constituents of interest in both the shallow fill and glacial till water bearing units underlying the Site.

In addition to the remedial action components specified in the NJDEP-approved RAWP to achieve Site-wide RAOs, additional activities were proposed in specific areas of the Site to enhance the remedial actions and facilitate the future brownfield redevelopment of the Site. Those activities are summarized in the following table:

TABLE 2-2 ADDITIONAL PROPOSED REMEDIAL ACTIVITIES	
Area/Remedial Activity	**Description**
Eastern Area- Remove existing tank/buildings	Remove existing tank/buildings. Recycle the steel tank off-Site, manage tank contents off-Site, re-use masonry type material on-Site as road base materials, dispose of asbestos off-Site.
Eastern Area - Operate IRM System	Operate IRM system until the project has progressed to the point that continued operation of the system is no longer feasible from an engineering and construction standpoint, or for 2 years from the date of the RAWP approval, whichever is longer.

TABLE 2-2
ADDITIONAL PROPOSED REMEDIAL ACTIVITIES

Area/Remedial Activity	Description
Eastern Area - Tar and Sediment Consolidation	Tar and visually impacted sediment associated with the dike will be consolidated and capped within their respective discrete areas of contamination. Visually impacted sediment in the "boom" area and other areas of visually evident tar and visually impacted sediment, 50 feet outboard of the sheet pile wall and to a maximum depth of three feet will be removed from the river and managed on-Site within the respective discrete areas of contamination.
Central Area - Surface Cover	Upgrade interim surface cover in accordance with the Site-wide plan surface cover plans.
Central Area - Production Wells	Abandon former groundwater production wells through implementation of the NJDEP-approved Work Plan. Install and sample deep (bedrock) monitoring well.
Central Area - Surficial Waste	Visually evident surficial waste material managed on-Site within respective discrete areas of contamination.
Western Area - Target Material Western Area – Dike	Management of target materials - target materials including waste piles, surficial tar and chromium slag - will be consolidated and capped on-Site within their respective discrete contamination areas. Some bulky material may be disposed of off-Site. Consolidation and capping of tar and visually impacted surficial material associated with the dike and dike extension.

2.2 PERMITS/AUTHORIZATIONS/NOTICES

The following table provides a summary of the permits obtained that were associated with the implementation of the remedial action and brownfield redevelopment of the Site. Copies of the permits are included as Volume III-B of the RAR and PR.

TABLE 2-3
SITE REMEDIATION AND BROWNFIELD REDEVELOPMENT PERMITS

No.	Authority	Permit Type and No.	Authorized Activity	Issued Date - Expiration Date
1.	ACOE	General Permit No. 7 - Application No. - 1998-012120-J2	Construction of stormwater management system outfalls	11/17/99 - 11/17/01
2.	ACOE	General Permit No. 6	Installation of soil borings and monitoring wells in the wetlands areas	10/02/97 - 10/02/99
3.	HMDC	Zoning Certificate - ZC-97-448	Interim placement of PDM/fill up to elevation +38 in the central area	09/30/97 - 09/30/98
4.	HMDC	Zoning Certificate - ZC-97-448	Transportation of PDM by truck	12/05/97 - 01/05/98
5.	HMDC	Zoning Certificate - ZC-97-448	Transportation of PDM by truck - extended hours	01/06/98 - 02/06/98
6.	HMDC	Zoning Certificate - ZC-97-448	30 day extension transportation of PDM by truck	01/16/98 - 02/21/98
7.	HMDC	Zoning Certificate - ZC - 97-448	Slurry wall construction and temporary material handling area on 25 acres in the eastern area	06/11/98 - 06/11/99
8.	HMDC	Zoning Certificate - ZC - 97-448	Temporary mixing plant in eastern area and stockpiles south of NJ Transit	06/29/98 - 06/29/99
9.	HMDC	Zoning Certificate ZC-97-448	7 day extension for transportation of PDM by truck	07/16/98 - 07/22/98
10.	HMDC	Zoning Certificate - ZC - 97-448	Temporary material handling and drying area on 16.6 acre in western area	08/25/98 - 08/25/99
11.	HMDC	Zoning Certificate - ZC - 97-448	Three feet of cover over 27 acres in northeastern area	02/05/98 - 03/20/98
12.	HMDC	Zoning Certificate - ZC - 97-448	Relocation of transmission lines and relocation of electric utilities in southeast corner of the Site.	03/02/99 - 03/02/00

TABLE 2-3
SITE REMEDIATION AND BROWNFIELD REDEVELOPMENT PERMITS

No.	Authority	Permit Type and No.	Authorized Activity	Issued Date - Expiration Date
13.	HMDC	Zoning Certificate - ZC - 97-448	Temporary material handling and drying area on 45 acres in eastern area	Not Issued - comments 04/13/98
14.	NJDEP	LURP-Waterfront Development Permit - 0901-97-0005.1	Reconstruction of existing dock	11/26/97 - 11/26/02
15.	NJDEP	LURP - Waterfront Development Permit - 0907-91-0006.10	Removal of 40,000 cy of sediments outboard of wall and capping 17 acres of freshwater wetlands	06/02/98 - 06/02/03
16.	NJDEP	LURP - Stream Encroachment Permit - 0907-91-0006.9	Installation of slurry wall, sheet pile wall, and stormwater basins and capping Site	06/25/98 - 06/25/03
17.	NJDEP	LURP - Stream Encroachment Permit - 0907-91-0006.11	Installation of concrete load-out pad	08/11/98 - 08/11/03
18.	NJDEP	NJPDES Permit #NJ0077588	Operation of DNAPL recovery IRM system	04/12/95 - Indefinite
19.	Hudson-Essex-Passaic Soil Conservation District	General Permit NJ0088323, SCD PFA #09 079803, File No. 97-H-0003/.97-H-1258	Soil erosion and sedimentation control plan for the interim fill	09/04/97 - 03/04/01
20.	Hudson-Essex-Passaic Soil Conservation District	File No. 97-H-1258	Soil erosion and sedimentation control plan for RAWP plans	06/30/98
21.	ACOE	Jurisdictional Wetlands Determination	N/A	07/10/2001 - 07/10/2006
22.	ACOE	Department of the Army, Sections 10 and 404, No. 1998-02120	Discharge of PDM into wetlands, wetlands compensation, excavation of contaminated sediments below mean low water	11/06/02 - 11/06/05
23.	NJDEP	LURP – Waterfront Development Permit – 0907-02-0003.1	Modification of Permit No. 15 for change in wetlands	06/02/98 - 06/02/03

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3.0 REMEDIAL ACTION ACTIVITIES

All remediation activities identified in Section 2.0 are discussed in this section. The status of each remediation activity is provided, indicating whether it is completed, in progress or planned. Various Site improvements necessary for brownfield redevelopment, but not directly associated with the remediation requirements, are also discussed.

3.1 SITE PREPARATION

Site preparation includes activities necessary to improve the Site to a condition acceptable for implementation of the surface cover and barrier wall actions, more specifically described in Section 4.1 of the RAWP.

3.1.1 Institutional Controls

Institutional controls consist of both physical and legal restrictions that control future Site use and access. The institutional controls and related tasks proposed for the Site were identified in a 1996 Institutional Controls, Remedial Action Work Plan (IC-RAWP), and in a separate Institutional Controls Plan prepared in 1997. The legal restrictions, including a Deed Notice (formerly known as a Declaration of Environmental Restriction) and CEA, will be implemented following completion of all remedial actions at the Site.

The Deed Notice will be issued to control and limit future human exposure to areas of the Site where COI concentrations in soil or PDM exceed the applicable Residential Direct Contact Soil Cleanup Criteria (RDCSCC), or "un-restricted use" standards. A draft Deed Notice was provided as Volume III-C of the RAWP. A revised draft Deed Notice will be submitted with future Remedial Action Report(s) to be completed when the additional remediation activities at the Site are complete. Following NJDEP approval, HCIA will execute the Deed Notice and file the executed copy with the Hudson County Clerk.

The CEA will be issued to restrict future use of groundwater to non-potable purposes for areas of the Site where COI concentrations in groundwater exceed the NJDEP Class II-A Ground Water Quality Criteria (GWQC). Based on comparison of Site groundwater quality in the shallow zone to the applicable criteria listed in Table 1 of N.J.A.C. 7:9-6, exceedances of the Class II-A standards for Site-related COI exist. Additionally, exceedances for non-Site related, or background, constituents in shallow groundwater exist. Therefore, a request for a CEA for the shallow-zone groundwater was submitted as Volume II-B of the RAWP to restrict the use of shallow groundwater at the Site. A CEA Fact Sheet and Public Notice will be distributed to the local municipal governing bodies.

Groundwater data for the deeper glacial till unit does not indicate the presence of Site-related constituents above the Class II-A criteria. It is noted, however, that naturally-occurring constituents, such as sodium and chloride, exceed their respective Class II-A groundwater standards in the glacial till. A CEA has not been required by the NJDEP for the glacial till unit.

The existing Site security consists of a combination of natural and man-made access barriers. The Site is located in a highly industrialized area of Kearny, New Jersey. The Hackensack River borders along the north and east sides of the Site. A steel sheet pile (SSP) wall runs continuously along much of the river. Most of the southern Site boundary is bordered by an approximately 30-foot high New Jersey Transit railroad embankment. Security fencing and a drainage channel are present along the western property boundary, which separates the western boundary of the Site from the Standard Chlorine Chemical Company property. Collectively, these barriers serve to isolate the Site.

There are three primary points of entry to the property: 1) the main gate and tunnel through the railroad embankment; 2) the riverside barge dock; and 3) the access road at the extreme western end of the Site. Access through the main gate is limited by security fencing and a locked gate located at the entrance to the Site near Fish House road. Access through the barge dock is by barge or boat only. Access via the western access road is limited by a gate and a security fence located on the Standard Chlorine Chemical Company Property. Individuals who are permitted to enter the Site include trained operators/technicians who operate the Interim Remedial Measures (IRM) DNAPL recovery system, and who complete groundwater monitoring activities. Because these activities could potentially result in exposure to Site constituents, these individuals are OSHA-trained in accordance with 29 CFR 1910.120, and are familiar with the Site-specific Health & Safety Plan. Other individuals who periodically access the Site include public utility maintenance personnel and personnel from the neighboring Owens-Corning/Trumbell facility during unloading of tanker ships. Signage is present on-Site to direct these personnel along restricted ingress/egress routes.

3.1.2 Former Production Well Abandonment and Bedrock Well

The NJDEP requested the investigation of four suspected production wells (PW-01, PW-02, PW-03, and PW-04) in correspondence submitted to Beazer on September 18, 1996[8]. Volume III-C of the RAR and PR contains production well reference materials. In order to satisfy the NJDEP request, and portions of the MOU, a letter work plan[9] was prepared to investigate the former deep production wells and bedrock groundwater. This letter work plan defined the proposed investigative approach for the deep production wells. Between July 1997 and July 1999, several investigative actions were executed to locate, identify, and abandon the suspected production wells. The investigative actions included reviewing historic Site information, including

8 NJDEP, December 17, 1997. Correspondence to ITEX.

9 Key Environmental, Inc., May 30, 1997. Letter Work Plan, Former Deep Production Wells and Glacial Till Groundwater. Submitted to NJDEP.

municipal records, facility drawings and aerial photographs. A surficial geophysics and shallow excavation program was also conducted.

3.1.2.1 Former Production Well PW-01

PW-01 was located in July 1997. Three unsuccessful attempts were made to clear obstructions from the well between July 1997 and July 1999. In August 1999, obstructions were successfully removed from the well to a depth of 131 feet below ground surface (bgs). On August 31, 1999, the NJDEP approved[10] abandonment of PW-01, and the well was subsequently abandoned at the 131-foot depth in accordance with the methods specified in N.J.A.C. 7:9-9, under the direct supervision of a New Jersey licensed well driller. An abandonment completion report was forwarded to the NJDEP on November 16, 1999 documenting the abandonment procedures[11], and is included in Volume III-C of the RAR and PR. Former production well PW-01 is identified on Figure 2.

3.1.2.2 Former Production Well PW-02

PW-02 was located in October 1997. An abandonment effort in February 1998 cleared the well of obstructions to a depth of approximately 324 feet bgs. Geophysical borehole logging was subsequently completed to characterize the bedrock formation[12]. Pursuant to NJDEP approval, groundwater samples were collected at "productive yielding bedrock zones" utilizing packer sampling equipment. The packer sampling equipment isolated two, 50-foot sample intervals between 200-300 feet bgs. The laboratory analysis of the sampled intervals demonstrated that concentrations of Site-related constituents were less than the respective NJDEP Class II-A Groundwater Quality Criteria[13].

The NJDEP provided verbal approval to abandon PW-02 on March 24, 1998. The well was subsequently abandoned in accordance with the methods specified in N.J.A.C. 7:9-9, under the direct supervision of a New Jersey licensed well driller. Former production well PW-02 is identified on Figure 2. Volume III-C of the RAR and PR includes the NJDEP well abandonment report for former production well PW-02.

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10 NJDEP, August 31, 1999. NJDEP Abandonment Approval for Production Well PW-01. Correspondence to Key.

11 NJDEP, November 16, 1999. NJDEP Abandonment Completion Report of Former Production Well PW-01. Submitted to NJDEP.

12 ITEX, March 2, 1998, Investigation of Former Groundwater Production Wells PW-01 and PW-02. Submitted to NJDEP.

13 KEY Environmental, Inc., May 4, 1998, Production Well PW-02 Bedrock Groundwater Sampling. Submitted to NJDEP.

3.1.2.3 Former Production Wells PW-03 and PW-04

Several investigative efforts were completed between 1997 and 1998 to locate suspected former production wells PW-03 and PW-04. The investigative efforts included reviewing historic Site information, including municipal records, facility drawings and aerial photographs, and performing surficial geophysics and shallow test pit explorations. Production wells PW-03 and PW-04 were never found, and were presumed lost or previously abandoned. NJDEP correspondence dated December 17, 1997 documented that these wells are to be considered "lost", and that no further abandonment efforts are required.

3.1.2.4 Bedrock Monitoring Well MW-131D

Bedrock monitoring well MW-131D was installed to characterize groundwater quality in the deep bedrock aquifer in the immediate vicinity of former production well PW-01. The installation and groundwater sampling of MW-131D were completed in accordance with the Supplemental Investigation of Former Groundwater Production Wells and Bedrock Groundwater Characterization Work Plan[14] as amended via a letter submitted to the NJDEP on March 2, 1998[15].

In summary, a six-inch steel casing was grouted 11.5 feet into competent bedrock at a depth of 79.5 feet bgs. A six-inch borehole was advanced from 79.5 feet bgs to a total depth of 450 feet bgs. Borehole geophysical logging was performed, including borehole video, temperature logging, resistivity/conductivity logging and caliper logging.

Bedrock groundwater samples were collected at 50 foot intervals from 95 feet to 450 feet bgs utilizing packer sampling equipment. The bedrock groundwater samples were analyzed for volatile organics, semi-volatile organics, dissolved metals, chloride, total dissolved solids, Weak-Acid-Dissociable (WAD) cyanide and total cyanide. The analytical results revealed that no Site-related COIs were identified in the samples at levels above the applicable groundwater criteria.

On June 23, 1999, the NJDEP requested that the deep bedrock monitoring well be completed to a depth of 135 feet bgs[16]. The well was completed with 2-inch diameter flush threaded Polyvinyl Chloride (PVC) well materials, and a screen interval of 111 – 126 feet bgs. The location of

14 KEY Environmental, Inc., September 5, 1997, Work Plan-Supplemental Investigation of Former Groundwater Production Wells and Bedrock Groundwater Characterization. Submitted to NJDEP

15 ITEX, March 2, 1998. Amendment to the Work Plan – Supplemental Investigation of former groundwater production well and bedrock characterization.

16 KEY Environmental, Inc., October 26, 1998, Bedrock Monitoring Well MW-131D.

bedrock monitoring well MW-131D is identified on Drawing RAR-D3. Volume III-C includes the Monitoring Well Construction Log for MW-131D.

3.1.3 Monitoring Well Installation, Abandonment, and Refurbishment

As discussed in Section 2.0, the Site-wide remedy for groundwater in the shallow fill zone is natural attenuation. The Natural Attenuation Performance Monitoring Plan, included as Volume IV-B of the RAWP, required the installation of new monitoring wells, the abandonment of existing wells, and refurbishment of selected existing wells. Additionally, groundwater monitoring in the glacial till was required as part of the monitoring plan.

3.1.3.1 Monitoring Well Installation

A total of 16 new shallow monitoring wells were installed on Site. The shallow monitoring wells were installed in accordance with NJDEP Monitoring Well Requirements for Unconsolidated Aquifers, as described in Appendix 7-1B of the NJDEP Field Sample Procedures Manual.

Table 3-1 identifies the existing monitoring wells on-Site. The locations of the shallow monitoring wells are identified on RAR-D2, D3 and D4. Volume III-C of the RAR and PR contains the Monitoring Well Construction Logs.

Several modifications were made to the monitoring wells proposed for installation, as they were presented in the RAWP. Specifically, shallow monitoring well MW-129 was added to the monitoring plan to provide an additional groundwater elevation monitoring location. Also, shallow monitoring well MW-130 was added to the monitoring plan as a groundwater sampling location to substitute for monitoring well MW-115, which was found to contain DNAPL shortly after installation. MW-115 was incorporated into the DNAPL monitoring plan for the Site. Shallow monitoring well MW-114 was removed from the monitoring plan because access to the proposed well location was not obtained from the adjacent property owner.

In addition, shallow monitoring well P-22 was relocated to accommodate the construction of a stormwater detention basin in the northeast corner of the Site. Monitoring well P-22 was abandoned in accordance with NJDEP requirements and replaced with monitoring well P-22R.

Finally, two (2) replacement glacial till monitoring wells, W-13R and W-30R, were installed to be included with other existing glacial till monitoring wells in the overall Site-wide monitoring program. Monitoring well W-13 was replaced with W-13R due to suspected damage in the W-13 riser pipe. Monitoring well W-30 was abandoned and replaced with W-30R to accommodate the construction of a stormwater detention basin located in the south west corner of the Site.

TABLE 3-1 EXISTING MONITORING WELLS FORMER KOPPERS SEABOARD SITE			
Monitoring Well I.D.	**Monitoring Well Permit Number**	**Screened Geological Unit**	**Activity**
C-3	26-10156	TILL	REFURBISHED
MW-100	26-47920	FILL	REFURBISHED
MW-101	26-47921	FILL	REFURBISHED
MW-102R	Not Available	FILL	REFURBISHED
MW-103	26-47923	FILL	REFURBISHED
MW-104	26-47924	FILL	REFURBISHED
MW-105	26-47925	FILL	REFURBISHED
MW-106	26-47926	FILL	REFURBISHED
MW-108	26-47927	FILL	REFURBISHED
MW-109	26-47928	FILL	REFURBISHED
MW-110	26-48754	FILL	REFURBISHED
MW-111	26-48755	FILL	REFURBISHED
MW-112	26-48756	FILL	REFURBISHED
MW-113	26-51236	FILL	INSTALLED
MW-115	26-51236	FILL	INSTALLED
MW-116	26-51237	FILL	INSTALLED
MW-117	27-51242	FILL	INSTALLED
MW-118	25-51238	FILL	INSTALLED
MW-119	26-51239	FILL	INSTALLED
MW-120	27-51245	FILL	INSTALLED
MW-121	26-51246	FILL	INSTALLED
MW-122	26-51247	FILL	INSTALLED
MW-123	26-51248	FILL	INSTALLED
MW-124	25-51243	FILL	INSTALLED
MW-125	25-51249	FILL	INSTALLED
MW-126	25-51250	FILL	INSTALLED
MW-127	25-51251	FILL	INSTALLED
MW-128	26-51252	FILL	INSTALLED
MW-129	26-51432	FILL	INSTALLED
MW-130	27-51433	FILL	INSTALLED
MW-131D	26-51541	BEDROCK	INSTALLED
P-19	26-8883	FILL	REFURBISHED
P-20	26-8872	FILL	REFURBISHED
P-22R	26-53722	FILL	INSTALLED

TABLE 3-1
EXISTING MONITORING WELLS
FORMER KOPPERS SEABOARD SITE

Monitoring Well I.D.	Monitoring Well Permit Number	Screened Geological Unit	Activity
P-24	26-8886	FILL	REFURBISHED
P-25A	26-8954	FILL	REFURBISHED
SWW-5.1R	Not Available	FILL	INSTALLED
SWW-6.5	26-10938	TILL	REFURBISHED
SWW-7.5	26-10939	TILL	REFURBISHED
SWW-9	26-10940	TILL	REFURBISHED
SWW-25	Not Available	FILL	REFURBISHED
W-9	26-8851	FILL	REFURBISHED
W-13R	26-49548	TILL	REFURBISHED
W-17	26-09453	TILL	REFURBISHED
W-25	26-10153	TILL	REFURBISHED
W-27	26-10162	TILL	REFURBISHED
W-29	26-10154	TILL	REFURBISHED
W-30R	26-51456	TILL	INSTALLED
W-31	26-10519	TILL	REFURBISHED

3.1.3.2 Monitoring Well Refurbishment

Twenty Six (26) monitoring wells were refurbished as part of the Monitoring Well Abandonment and Refurbishment Plan specified in Volume IV-A of the RAWP. The monitoring wells were refurbished to extend the height of the well riser pipes and protective casings to an appropriate height above the surface grade to accommodate the placement of PDM.

Monitoring well refurbishment was completed by installing new protective casings and/or concrete pads, or by installing oversized protective casings. In order to accommodate the anticipated PDM fill elevations, the height of the existing well riser pipe was modified by adding a section of riser pipe. New protective steel casing of appropriate length was installed, with the exposed end containing a threaded connection to allow for future extensions. The annular space between the modified riser and protective casing was sealed with grout, and a threaded locking cap connection was installed. In some instances the existing well riser pipe was extended by adding a new section of riser via a threaded connection or slip fit connection. All refurbished well locations were surveyed by a New Jersey-licensed surveyor.

Table 3-1 above provides a summary of the wells refurbished as part of the Monitoring Well Abandonment and Refurbishment Plan. The refurbished well locations are included on

Drawings RAR-D2, D3 and D4. Volume III-D of the RAR and PR includes the well construction logs and well certifications (Form B).

3.1.3.3 Monitoring Well Abandonment

Thirty-nine (39) monitoring wells were abandoned as part of the Monitoring Well Abandonment and Refurbishment Plan specified in Volume IV-A of the RAWP. The monitoring wells were abandoned in accordance with the methods specified in N.J.A.C. 7:9-9 under the direct supervision of a New Jersey-licensed driller.

The typical monitoring well abandonment utilized at tremmie pipe, placed at the base of the well, to pressure grout the well to ground surface. In order to prevent potential vertical migration of COIs from the shallow zone to deep zone groundwater, glacial till zone monitoring wells W-13 and W-30 were overdrilled to remove well construction materials prior to pressure-grouting the wells in place.

Table 3-2 provides a summary of the wells abandoned as part of the Monitoring Well Abandonment and Refurbishment Plan. The locations of the abandoned wells are depicted on Figure 2. Volume III-D of the RAR and PR contains the Monitoring Well Abandonment Logs.

TABLE 3-2
ABANDONED MONITORING WELLS
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Monitoring Well I.D.	Monitoring Well Permit Number
CR-1	Not Available
CR-2	Not Available
CR-4	26-10157
CR-5	Not Available
CR-9	Not Available
CR-10	Not Available
CR-11	Not Available
CR-12	Not Available
P-01	26-8948
P-03	26-8875-4
P-04	26-8876-2
P-05	26-8879-7
P-6.5	26-10938 *
P-7.5	26-10939 *
P-08	26-8878-9
P-16	26-8870-3

TABLE 3-2
ABANDONED MONITORING WELLS
FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Monitoring Well I.D.	Monitoring Well Permit Number
P-17	26-8871-1
P-18	26-8882
P-21	26-8884
P-22	26-8873
P-25B	26-8955-6
P-30	26-10513
P-31	26-10514
P-32	26-10515
P-33	26-10516
PW-01	Not Available
PW-02	Not Available
SWW-5	26-10936
SWW-5.7	26-10937
SWW-6.5	26-10938
SWW-7.5	26-10939
W-1	26-8842
W-2	26-8843
W-3	26-8849
W-04	26-8844
W-7	26-8846
W-08	26-8855
W-10	26-8852
W-11	26-8847
W-23A	26-10520
W-23B	26-10521
W-24	26-10160
W-26	26-10161
W-28	26-10163
W-32	26-10164

* PERMIT NUMBER UTILIZED FOR PERMANENT MONITORING WELLS INSTALLED AT SAME LOCATION

3.1.4 Tanks Contents Removal and Off-Site Recycling/Disposal

The required remedial activities for a one million gallon steel storage tank are fully described in the NJDEP-approved Remedial Action Work Plan (Tank-RAWP) dated February 1996[17]. The required remedial activities included tank contents removal, material shipment for off-Site disposal, tank demolition and scrap steel recycling. The former location of the storage tank is shown on RAR-D2. In summary, the remedial action objectives, as stated in the Tank-RAWP, were as follows:

- Remove and either recycle or dispose of tank contents at an off-Site facility in accordance with applicable state and federal regulations.
- Removal and recycling of the scrap steel tank walls, internal steel support structure and any liner in accordance with applicable state and federal regulations.

As reported in the Tank-RAWP, 7~7, Inc. (7~7), a Wooster, Ohio-based coal tar recycling company, was retained by Beazer to complete the tank contents sampling and analysis in accordance with a proposal dated June 27, 1995. Following sampling and analysis, a report dated October 4, 1995 was prepared by 7~7 for Beazer[18], and is included in Volume III-E of the RAR and PR. The contents of the tank were considered to be classified as the following wastes:

- K 141 - Process residues from the recovery of coal tar, including but not limited to, tar collection sump residues from the production of coal from coal or the recovery of coke by-products produced from coal.
- D 018 - Solid waste containing benzene.

Remedial activities occurred during the period of February 2, 1999 to May 9, 1999.

Weekly reports were prepared by KEY to track progress of the project. The weekly progress reports and photo documentation are included as Volume III-E of the RAR.

Tank contents consisted of solid (dry), semi-solid and liquid material. Semi-solid material was stabilized on-Site with cement kiln dust (CKD) prior to shipment off-Site. Stabilized and dry materials, classified as D 018, were removed and transported under hazardous waste manifest to a SK Services disposal facility located in Corunna, Ontario. Liquid waste classified as K 141

[17] Key Environmental, Inc., February 1996, Remedial Action Work Plan - Tank Contents Removal and Disposal

[18] 7~7, Inc., October 4, 1995, Tar Storage Tank Sampling for Beazer East, Inc.

was removed and transported to a NJDEP approved incinerator. The 1999 Federal Hazardous Waste Report prepared by the Waste Generator/Responsible Party (Beazer) is included in Volume III-E of the RAR and PR and indicates that a total of 3,522.2 tons of solid waste and 134.8 tons of liquid waste were generated and properly disposed in accordance with the Tank-RAWP.

Following removal of tank contents, tank material (i.e., steel) was cut and resized using an excavator with specialized shears. It was then shipped to an approved scrap recycling facility, Naparano, located in Newark, New Jersey.

3.1.5 Target Material In-Situ Stabilization and/or Consolidation

The remedial action objectives for in situ stabilization and/or consolidation of target materials are outlined in the Site Preparation Design Report (Section 2.1.5 -Volume III-A of the RAWP). Target materials include potential characteristically hazardous and non-hazardous waste piles, dike material, Hackensack River sediments, and materials excavated during implementation of remedial activities at the Site. The type and approximate volume of target materials that were identified in the RAWP as requiring stabilization and/or consolidation, and the respective completion status, are summarized in the table below.

TABLE 3-3
SUMMARY OF TARGET MATERIALS
PROPOSED REMEDIAL ACTION AND STATUS

Description	Area of Site	Approximate Quantity (CY)	Proposed Remedial Action	Remedial Status
Potentially Hazardous Light Oil Deposit Area	West	2,700	Stabilize in place	Not Complete
Potentially Hazardous Waste Piles	West	2,400	Stabilize in place	Not Complete
Potentially Hazardous Chromium	West	50	Stabilize in place	Not Complete
Non-Hazardous Waste Piles	West	5,600	Consolidate and cap	Not Complete
Western Area Dike Extension*	West	2,700	Consolidate and cap	Not Complete
Non-Hazardous Chromium	West	450	Consolidate and cap	Partially Complete
Dike Materials	East, West, Central	10,000	Consolidate and cap	Completed
Slurry Wall Excavation Spoils	East	9,000	Consolidate and cap	Completed
Sediments	River	5,500	Consolidate and cap	Not Complete
Surficial Tar	East	2,500	Cap	Completed
Surficial Chrome (Non-Hazardous)	East	16	Cap	Completed

*Note: located outboard of steel sheet pile in inter-tidal wetland area.

The RAWP stipulated that the target materials would be consolidated in a designated Area of Contamination (AOC), as provided by the National Contingency Plan (55 FR 8758-8760, March 8, 1998), and within the general vicinity where they originated on-Site. AOCs were designated for the Site, as depicted on RAWP drawing RA-D10. Following consolidation and spreading of the target materials within the AOC, the target materials were to be covered by a minimum of two feet of low permeability structural fill (i.e., PDM).

The quantity of some target materials that would require consolidation and capping was increased relative to the quantities specified in the RAWP. The potential volume of river sediment target material increased from 5,500 cubic yards (CY) to approximately 15,000 CY because of a requirement from the NJDEP to excavate sediments to greater depths and over a larger area than those proposed in the RAWP. In addition, the quantity of slurry wall excavation spoils increased from approximately 8,000 CY to 9,000 CY because approximately 855 linear feet of the slurry wall trenching was extended roughly 10 feet deeper than anticipated.

The width of the AOC located adjacent to the slurry/steel sheet pile (SSP) wall barrier in the northeastern portion of the Site was increased from approximately 150 feet to approximately 300 feet to accommodate the additional volume of target materials that required consolidation and capping. The revised AOC limits, as depicted on Drawing RAR-D3 and included as Volume II-A of the RAR and PR, were approved by the NJDEP following a meeting on January 21, 1999.

Activities Completed: Remediation of many target materials at the Site could not be completed because the requisite New York District, Army Corps. Of Engineers (NYD-ACOE) permits (i.e., wetland and dredge/fill ACOE Section 10\404) had not been obtained at the time SK Services was on-site performing the remediation. However, nearly all of the target materials that *could* be addressed without triggering these permits have been remediated in accordance with the RAWP. During implementation of remedial activities at the Site between May 1998 and August 1999, various target materials were consolidated within the AOC. These materials included slurry wall excavation spoils, dike material excavated during construction of the SSP wall and PDM Key, and the eastern area surficial tar. Most of the target materials were consolidated in the eastern area of the Site and capped with structural fill. However, some of the dike materials were consolidated in the western AOC where other waste piles are present. The surficial tar and chromium areas identified in the eastern area of the Site have been capped as stipulated in the RAWP. The areas where target materials have been consolidated and capped are depicted on RAR-D2, D3 and D4, which are included as Volume II-A of the RAR and PR.

Activities Remaining: Except for the slurry wall excavation spoils, dike materials, and the eastern area surficial tar, which all have been completed, the target materials listed in the previous table will require stabilization and/or consolidation and capping within the AOC. As pointed out earlier, stabilization and/or consolidation of most of the remaining target materials requires wetland and ACOE Section 10\404 permits. On November 8, 2002 NYD-ACOE issued the Section 10/404 permit for the project. The permit allows for placement of the PDM into wetlands and waters of the United States, in addition to excavation of sediments below the mean low water (MLW) of the Hackensack River. Note that the permit requires that the permittee (HCIA) 1.) purchase wetlands mitigation credits, 2.) restore disturbed shoreline areas, and 3.)establish additional on-site tidal emergent wetlands to compensate for the loss of wetlands and waters. In order to achieve the mitigation requirements, the permit requires that the permittee provide written verification of wetlands mitigation credit purchases and submit a detailed wetlands mitigation plan for the shoreline restoration and tidal emergent wetland creation. To date, this has not been completed.

3.1.6 IRM System

The IRM system was installed to recover coal tar DNAPL located in certain portions of the northeast area of the Site. The initial IRM system consisted primarily of two recovery trenches located near the former tar processing area of the Site, and two recovery wells (RW-01 and RW-02) located in the vicinity of well W-27. It also included a pre-existing program, including two floating containment booms and four containment fence structures located in the Hackensack River along the north eastern shoreline. In 1995, Beazer expanded the IRM system to include two additional recovery wells (RW-03 and RW-04) located east of W-27, and three additional recovery wells (RW-05, RW-06, and RW-07) located east of the recovery trenches. The primary components of the IRM system are illustrated on Drawing RAR-D2 contained in Volume II-A of the RAR and PR.

Operation of the IRM system consists of recovery of total fluids (combined groundwater and DNAPL) via electronically driven gear pumps. The combined groundwater/DNAPL stream is directed to a central DNAPL recovery process where DNAPL is removed from groundwater in a two-step process consisting of gravity settling followed by coalescing separation. Recovered groundwater is re-circulated on-Site via an infiltration/percolation trench in accordance with a New Jersey discharge permit, NJPDES-DGW Permit No. 0077577 dated August 1, 1993.

DNAPL recovered through the operation of the IRM system was, in the past, recycled as a raw material in an off-Site coal tar processing operation. Currently, any recovered DNAPL is recycled at a licensed fuels blending facility. Reports provided to the NJDEP on an annual basis provide specific information regarding the performance of the IRM system. The amount of recovered product is reported in the NJPDES Semi-Annual Monitoring Reports.

On April 8, 1998 the NJDEP issued a time extension for IRM operation under the existing permit. In accordance with RAWP, the IRM system was to be operated for a minimum of two years following RAWP approval or until the area is needed for placement of PDM, whichever is longer. At present the IRM system has operated for over 4 years since RAWP approval.

3.1.6.1 IRM Electrical System and Components

Electrical service to the IRM system is supplied at the main IRM building. 440 volt, 3-phase power is supplied, and transformed to 240/120 volt, single phase within the building for single phase loads. Separate breaker panels are provided for 440 volt, 3-phase distribution and single phase distribution.

A main control panel is provided which operates the effluent transfer pump, and which monitors for high level alarm conditions in the main influent tank (T-101) and the effluent tank (T-103). Operation of the transfer pump is controlled by float type level switches installed in tank T-103. High level alarms, should they occur, require manual reset of the control panel.

A secondary control panel controls operation of the recovery pumps. The recovery pump system is divided into three segments - a west segment (wells RW-1 through RW-4), a mid segment (both recovery trenches) and an east segment (wells RW-5 through RW-7). The control panel includes repeat cycle timers which energize each segment of the recovery pump system on individual timer control. The secondary control panel interlocks with the main control panel to halt recovery pump operation in the event of a system alarm.

Electrical power to the recovery pump system segments is delivered from the secondary control panel to the recovery pumps via 10 gauge direct burial metal clad cable. Three individual cable runs are provided, one for each system segment. The direct burial cable is interconnected between each recovery well on each segment, with 2" PVC conduit provided between recovery wells to allow access to and service of the interconnecting wiring. A control and distribution box is provided near each recovery well, adjacent to the sheet pile barrier wall. A 1" PVC conduit connects the control boxes to the recovery wells. Each well is equipped with a 1/3 horsepower gear pump operating on 110 VAC, single phase.

3.1.7 Infrastructure Modification

The parties recognized that implementation of the remedial action and future redevelopment of the Site would require modification to the existing infrastructure of the Site. Thus the parties identified several site infrastructure modifications in the NJDEP-approved RAWP. The following sections summarize the infrastructure improvements identified in the RAWP that have been completed. Note that the infrastructure improvements included in the RAWP were not required as remedial responses to the RAOs, but rather were required to facilitate remedial action implementation and future brownfield redevelopment.

3.1.7.1 Wetlands

The original survey of jurisdictional wetlands by Lawler, Matusky and Skelly Engineers, L.L.P. (LMS) in 1997 identified 1.86 acres of inter-tidal wetlands and 17.89 acres of non-tidal wetlands on the Site. Subsequently, a survey performed by PS&S in 2001 resulted in the redelineation of jurisdictional wetlands. On July 10, 2001 the NYD-ACOE determined that the Site contained a total of 5.96 acres of jurisdictional wetlands. Drawing RAR-D5 of RAR and PR Volume II-A provides a description of the wetlands and their respective areas. On November 8, 2002 the NYD-ACOE issued Section 10/404 permits to place PDM in approximately 3.6 acres of wetlands and waters of the United States to facilitate placement of a cap over the site pursuant to the RAWP. Wetland replacement requirements include both on-site and off-site mitigation. HCIA has arranged off-site mitigation for the majority of the wetlands that will be affected.

3.1.7.2 Building Removal

The parties determined that two buildings, a former one-story office building and a water distribution valve shed, would have to be removed for cap placement and development. The buildings were demolished by SK Services, and masonry debris from the structures was reused on-Site as road base materials. Prior to demolition, the buildings were surveyed for asbestos and all asbestos-containing materials were removed and disposed off-Site by SK Services. Drawing RAR-D2 shows the location of the former buildings that were demolished.

3.1.7.3 Utility Relocation and Abandonment

Prior to implementation of the remedial action, the Site had above-ground electric service, an abandoned underground natural gas service line, and underground water service. To facilitate cap placement and development, SK Services conducted the following utility relocation and abandonment activities.

Electric – The PSE&G electrical transmission line was relocated in the central area of the Site. The overhead electrical transmission line in the east and west areas of the Site have not been relocated. However, SK Services and PSE&G have developed a draft relocation plan, should relocation be necessary. The existing electrical transmission line is shown on Drawings RAR-D2, D3 and D4 of Volume II-A of the RAR and PR.

Water - The existing City of Kearny water service line was sealed near the entrance to the Site on Fish House. A temporary service connection was constructed to allow for temporary construction-related water use and for future reactivation of the water service.

3.1.7.4 Dock Repair and Load-out Pad Construction

SK Services improved the exiting dock and constructed a load out pad to facilitate the placement of PDM at the Site. Drawing RAR-D2 of Volume II-A of the RAR and PR provides general information related to the improved concrete load out pad.

3.2 SURFACE COVER

The surface cover component of the remedial action was designed to prevent direct contact exposure to existing Site soils that exceed the NJDEP soil criteria. In addition, the construction of a surface cover at the Site would provide the additional benefit of reducing the infiltration of precipitation and the associated recharge to shallow groundwater. Per the RAWP and Three Party Agreement, the surface cover design requirements included the following:

- The surface cover will provide a surface cover layer with a minimum thickness of two feet over the entire Site. Additionally, the surface cover will be erosion resistant, and constructed to grades and elevations that prevent ponding and promote runoff to stormwater control devices in order to minimize infiltration to shallow groundwater.

- The surface cover will provide an in-place permeability of 1×10^{-6} cm/sec for the final two feet of structural fill to minimize infiltration of runoff into the structural fill. Also, the cover will provide an in-place permeability of 1×10^{-6} cm/sec in the first two feet of structural fill over Site soils or, if not achievable, in a subsequent overlying two-foot lift.

- The first two feet and final two feet of surface cover will meet the NJDEP NRDCSCC. Any PDM exceeding the NRDCSCC or the Owner's soil placement criteria will be placed under at least 2 feet of PDM or other material meeting the NRDCSCC as an engineering control.

- Pursuant to the Three Party Agreement, in order to accommodate future redevelopment, the placed PDM was to achieve a minimum Unconfined Compressive Strength at 28 day curing of 3,000 pounds per square foot (psf), and a minimum final elevation of +10 feet msl. Note that these requirements are associated with brownfield redevelopment and are not remedial action requirements.

Following receipt of the necessary authorizations from the NJDEP and the HMDC, the construction of the surface cover was initiated in December 1997. During implementation, construction quality assurance was performed by, or under the direction of, SK Services.

Testing of the surface cover material included PDM permeability testing, PDM strength tests, and analytical testing of PDM and Raw Dredge Material (RDM). Test results were used to verify that the surface cover design requirements were being met. Testing was performed by various subcontractors (e.g., ITEX, MRCE, Matrix, etc.) to SK Services.

In conjunction with construction of the surface cover and according to HCIA SK Services placed or stockpiled approximately (one million one hundred thousand) 1,100,000 cubic yards of PDM over a substantial portion of the Site. RAR and PR Volume II-A, Drawing RAR-D5 shows the Site topography as a result of stockpiling or placing the PDM. Also shown on RAR-D5 are the limits of PDM or other approved fill estimated to have a minimum thickness of 2 feet. The estimated areas were derived by comparing the 1995 survey prepared by PS&S with a more recent aerial survey performed in 2000.

Readily available information on sampling and testing of PDM placed or stockpiled at the Site is summarized in the table below. Referenced items are provided as Volume III-F of the RAR and PR.

TABLE 3-4
SURFACE COVER REFERENCE INFORMATION

Item No.	Reference Item	Comment	Issue
1.	Letter from ITEX to Paulus, Sokolowski and Sartor, Inc. (PS&S) Date of Reference: December 23, 1997	Geotechical Testing and Monitoring Plan Interim Storage of Structural Fill.	None
2.	Letter from SK Services to PS&S. Date of Reference: July 2, 1998	Geotechnical Testing	Proposed "Field and Laboratory Geotechnical Testing and Monitoring Protocol for Placement, Compaction, Quality Assurance and Quality Acceptance of Processed Dredge Material (PDM) at Seaboard Site, Kearny, NJ."
3.	Letter from PS&S to SK Services. Date of Reference: July 13, 1998	None	Letter indicates certain aspects of PDM placement work were inconsistent with established protocols.
4.	July 16, 1998 SK Services to PS&S. Geotechnical testing	Response to the letter 7/13/98	Clarification of field testing procedures.
5.	Geotechnical Testing and Inspection results prepared by Matrix Environmental & Geotechnical Services (MATRIX) and submitted to SK Services. Date of Reference August 4, 1998	A leveling course consisting of two lifts of PDM was tested and approved in most grids.	Permeability data outstanding.
6.	Permeability Status Summary Processed Dredge Material (PDM), Seaboard Site, Prepared by: Matthew Ludwig, Matrix, September 2, 1998	Table of Permeability results for various lifts and grid locations.	Majority of permeability results do not meet RAWP requirements of $1x10^{-6}$ cm/sec.

The PDM placed or stockpiled on the Site originated from dredge sediments from federal channel areas located in the Port District of New York and New Jersey. Readily available information on analytical and geotechnical testing of PDM and RDM prior to placement at the Seaboard Site is summarized below. Referenced items are provided in Volume III-F of the RAR and PR.

TABLE 3-5
SUMMARY OF DREDGE SEDIMENT REFERENCE MATERIAL

Item No.	Reference Item	Comment	Issue
1.	Arthur Kill, USCOE Contract 0031 prepared by Lawler, Matasky & Skelly Engineers. Date of Reference: November 1997	Raw and processed dredge material, bulk and physical data, extract data	Exact location of material placed at the Site is not known.
2.	Port Jersey dredge sediment analytical data summary prepared by Technicon, Inc. Compared raw dredge samples to processed dredge samples. Date of Reference: February 28, 1997	PDM exceeded the NRDCSCC for various constituents.	Exact location of material placed at the Site is not known.
3.	First Quarterly Report (January 1 - March 31, 1998) prepared by ECDC East, L.C. and submitted to the NJDEP. Date of Reference: April 20, 1998	Presents off-Site dredge quantity, barge quantity of PDM and placement information at the Site (i.e., unload date, lot number and grid location).	PDM quality unknown. Grid labeling system different from Third Quarter.
4.	On behalf of SK Services, Investment Recovery, LLC (IRL) submitted a PDM sample collected from the Port Jersey Outer Channel that was analyzed for VOCs to the HCIA. Date of Reference: October 9, 1998.	HCIA approved the placement of PDM from the Port Jersey Outer Channel at the Seaboard Site.	Quantity unknown, not known if this material was placed at the Site.
5.	Third Quarterly Report (July 1 - September 30, 1998) prepared by IRL and KEY and submitted to the NJDEP. Date of Reference: October 20, 1998.	Presents off-Site dredge quantity, barge quantity of PDM and placement information at the Site (i.e., unload date, lot number and grid location)	PDM quality unknown. Grid labeling system different from First Quarter.

A general summary of surface cover data as compared to RAWP requirements follows:

1. **Thickness** - Based on recent mapping at least two feet of PDM has been placed or stockpiled over approximately 45 acres of the Site. Additional data is necessary to verify the PDM thickness in certain areas.

2. **Permeability** - Majority of the individual samples obtained from PDM placed at the Site do not meet the RAWP permeability requirement of 1×10^{-6} cm/sec. PDM permeability was generally in the 1×10^{-5} range.

3. **Quality** - Statements in the AUD progress reports and raw dredge testing results indicate that the PDM meets the NRDCSCC.

4. **Strength** – A majority of the individual samples obtained from PDM placed at the site meet the 3,000 psf criteria as required by the TPA.

5. **Grading/Drainage** – A stormwater management system comprised of channels, detention basins, and outfalls to the Hackensack River was designed and permitted to accommodate the anticipated grading plan for the site surface cover. Although the grading plan was not achieved, the existing topography shows that, the drainage patterns at the site are not resulting in excessive erosion or sedimentation discharge.

Remaining activities relative to the Surface Cover include, at a minimum, placement of at least 2 feet PDM over the remaining areas. A revised grading plan and stormwater management system will be designed for the surface cover.

3.3 BARRIER WALL

According to the RAWP, engineering controls in the form of barrier walls were specified to mitigate the migration of DNAPL to the Hackensack River and to promote natural attenuation of dissolved COI in groundwater by diverting shallow zone groundwater. The barrier walls were to consist of a steel sheet pile (SSP) wall, slurry wall, and PDM key. The following summarizes the barrier wall activities completed and the remaining RAWP-related requirements associated with the slurry wall, SSP wall and PDM Key.

3.3.1 Slurry Wall

The NJDEP-approved RAWP provided a design for a slurry wall along portions of the northern, eastern and southern boundaries of the Site. The objective of the slurry wall was to partially-contain and stagnate shallow groundwater in the eastern portion of the Site, where the majority of potential source material, including DNAPL, exists as a result of the former coke and coke by-products processing operations. The slurry wall would mitigate direct discharge of DNAPL and impacted groundwater to the Hackensack River, stagnate and/or control groundwater, and promote natural attenuation of dissolved constituents in groundwater prior to discharging off-Site. The alignment of the slurry wall was based on the results of fate and transport modeling identified in Volume II-A of the RAWP. The design requirements for the slurry wall as stated on page 4-10 of the RAWP were:

- Contain DNAPL and shallow groundwater in the fill unit in the Eastern Area of the Site;

- Extend a minimum of three (3) feet into appropriate underlying confining unit(s);

- Provide a sufficient capillary entrance pressure to provide an effective barrier to lateral DNAPL migration;

- Comply with applicable New Jersey slurry wall requirements regarding permeability and wall thickness; and,

- Be compatible with the Site constituents.

The Barrier Wall Design Report (Volume III-C of the RAWP) and the Slurry Wall Backfill Mix Design Report[19] presented the design of the slurry wall. The mix design for the slurry wall was based on a previous study[20] that verified the compatibility of the slurry wall materials with subsurface contaminants and DNAPL present at the Site. The mix design specified a bentonite-soil mix ratio of 5.3% by weight to achieve a maximum permeability of 10^{-7} cm/sec. In addition, the approved mix design was tested for capillary entrance pressure in the laboratory to verify that DNAPL would not penetrate the slurry wall when subjected to "worst case" hydrostatic conditions (e.g., full saturation of the soils adjacent to the slurry wall to elevation +10 ft-msl, or 4.33 psi). Following design of the slurry wall, a Slurry Wall Construction Specifications Report[21] was developed for Quality Assurance/Quality Control (QA/QC). Drawing RA-10 through RA-16 of the RAWP presented the plan location, details, profiles and cross sections for the slurry wall.

Conti Environmental, Inc., (CEI) constructed the slurry wall between July 20, 1998 and December 12, 1998. KEY Environmental, Inc., personnel provided daily oversight during slurry wall construction.

The materials used to construct the slurry wall included clean, imported soil from the McNear borrow pit in Landing, New Jersey, powdered bentonite (brand Bara-Kade 90), and potable water from the Town of Kearny. The imported soil and bentonite were mixed in a "cell" constructed of imported soil, with 3-foot high berms and covering an area of approximately 10,000 square feet. The imported soil backfill was first spread in a uniform loose lift across the mixing cell. After spreading imported fill across the mixing cell, the thickness and dimensions of the loose lift were measured to determine the corresponding volume of soil. The average in-place density of the loose lift was determined using a nuclear density gauge. These values were then used to calculate the mass of soil in the mixing cell which, in turn, was used to calculate the quantity of bentonite required to achieve a minimum of 5.3% bentonite per dry weight of soil, per the approved mix design.

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19 Conti Environmental, Inc., July 15, 1998, Slurry Wall Backfill Mix Design Report

20 Goldberg-Zoino & Associates, Inc., August 1998, Soil/Bentonite Backfill Design Report

21 Key Environmental, Inc., April 1998, Slurry Wall Construction Specifications

The bentonite-water slurry was mixed on-Site, and temporarily stored in 20,000 gallon storage tanks. During excavation of the slurry wall trench, the bentonite-water slurry was cycled into the trench to maintain the stability of the trench sidewalls. The bentonite-water slurry was also mixed with the imported soil and dry bentonite to prepare the soil-bentonite backfill. The soil-bentonite backfill was transported to the trench via dump trucks and placed in the trench, which displaced the bentonite-water slurry in the trench. QA/QC testing was performed by CEI throughout slurry wall construction activities in accordance with the QA/QC plan. Volume III-G of the RAR and PR includes weekly status reports documenting construction activities and QA/QC test results.

The slurry wall extends from station 78+10 to station 34+95, which equates to a length of 4,315 feet. RAR-D2 provides the as-built plan location of the slurry wall. The slurry wall was constructed to a minimum thickness of 3 feet. As-built cross sections of the slurry wall are included on Drawing RAR-D7, and indicate the base of slurry wall extends into the peat where the peat layer was at least 3 feet thick or into the varved clay where the peat was not 3 feet thick. The depth of installation into either the peat or varved clay confining unit was a minimum of 3 feet.

CT&E Environmental Services, Inc., (CT&E), under the direction of KEY, completed post construction QA/QC activities. These included collecting undisturbed samples sufficient to meet the specification of 1 sample per 500 linear feet of slurry wall. Samples were tested for permeability in accordance with ASTM Method D5084. Test results provided in Volume III-G of the RAR and PR indicate that the slurry wall achieved the permeability specification of 1×10^{-7} cm/sec.

3.3.2 Steel Sheet Pile Wall

The RAWP provided a design for a SSP wall along the Hackensack River. The design requirements for the SSP wall were as follows:

- Contain the existing dike and provide shoreline erosion protection;
- Satisfy all contractual requirements between HCIA and SK Services related to the grade of steel and cathodic protection;
- Minimize groundwater discharge from the fill unit and the intermediate sand units, which underlies the meadow mat unit in the central and western portion of the Site to the Hackensack River; and,
- Construct the SSP wall with a top elevation above the 100-year flood plain

The Barrier Wall Design Report (Volume III-B of the RAWP) presented the design of the SSP wall and included a permeability calculation for the SSP wall, structural calculations, drawings and geological profiles. In order to meet the design requirements, the wall was designed using sealed joints to minimize permeability, and was located to embed it into the varved clay underlying confining unit. Drawings RA-D10 though RA-D16 of the Final Design Drawings included with the RAWP presented the plan, details, profiles, and cross sections for the SSP wall.

Following the NJDEP approval of the RAWP, the proposed alignment of the SSP wall was modified as required by the NJDEP Land Use Regulatory Program (LURP) to obtain the necessary permits/authorizations. Following receipt of the permits, final design drawings, calculations and specifications were developed by Mueser Rutledge Consulting Engineers (MRCE). Bid documents were prepared in June 1998. Note that, in order to reduce the permeability of the SSP wall, the bid documents specified the use of a hydrophillic (water-swelling) joint sealant (Adeka A-50) over the entire length of the SSP wall. Linde-Griffith Construction Company of Newark, New Jersey was selected by SK Services as the SSP wall subcontractor, and MRCE was retained to perform construction QA/QC during SSP wall installation.

Linde Griffith constructed the Steel sheet pile wall from September 23, 1998 to November 24, 1998. MRCE provided daily oversight during wall construction while performing construction quality assurance. As part of the quality assurance activities, MRCE prepared a total of 59 Daily Field Reports documenting the installation of the Steel sheet pile wall. In addition, MRCE prepared Final Field Coating Approval documentation (2 sheets), Tierod & Deadmean Installation documentation, Steel Sheet Pile Wall documentation (6 sheets), and Interlock Sealant documentation (36 sheets). RAWP Volume III-H of the RAR and PR provides Steel sheet pile reference information.

Following construction, MRCE prepared a set of Record Drawings. A list of the Record Drawings prepared by MRCE and provided in Volume III-H of the RAR and PR are listed as follows:

Drawing Title

Steel Sheet Pile Wall Plan Sheet No. 1 - SP-1, MRCE, 2/22/99

Steel Sheet Pile Wall Plan Sheet No. 2- SP-2, MRCE, 2/22/99

Steel Sheet Pile Wall Plan Sheet No. 3- SP-3, MRCE, 2/22/99

Steel Sheet Pile Wall Plan Sheet No. 4- SP-4, MRCE, 2/22/99

Steel Sheet Pile Wall Plan Sheet No. 5- SP-5, MRCE, 2/22/99

Steel Sheet Pile Wall Plan Sheet No. 6- SP-6, MRCE, 2/22/99

Steel Sheet Pile Wall Sections - SP-7, MRCE 2/22/99

Steel Sheet Pile Wall Sections and Details - SP-8, MRCE, 2/22/99

Steel Sheet Pile Wall Details - SP-9, MRCE, 2/22/99

As observed and documented by MRCE, the Steel sheet pile wall was installed in accordance with the NJDEP-approved RAWP and the required permits, with two minor exceptions, as shown on the Record Drawings included as Volume III-H. (Installation varied from the RAWP where field conditions prohibited installation of the Steel sheet pile wall to the design tip elevation and in the western area of the Site where Site conditions required that the return was installed 50 feet east of its designed location.) Materials excavated along the Steel sheet pile wall alignment were consolidated in the AOC and are fully described in Section 3.1.5 of the RAR and PR. As calculated from the as-built drawings, a total of 195,039 square feet of Steel sheet pile wall was installed, which weighed an estimated 2,250 tons.

3.3.3 PDM Key

As part of the Barrier Wall remedy, placement of a low permeability backfill, consisting of PDM, was proposed to create a "redundant barrier" to prevent the off-Site migration of shallow groundwater containing COI at concentrations in excess of applicable standards. The PDM was to be keyed into the shallow confining unit along the Steel sheet pile wall where the slurry wall is not present between stations 0+00 and 38+50.

In accordance with the RAWP Vol. III-C, the design requirements for the PDM key are as follows:

- The PDM key shall be designed to contain shallow groundwater in the fill unit in the Central and Western areas in conjunction with the sealed SSP wall;
- The PDM key shall extend three feet , where practical , into the meadow mat unit at the Site; and,
- The PDM key was to meet the performance requirements detailed in the Surface Cover Design Report (RAWP Vol. III-B). These requirements include achieving a maximum permeability of 1×10^{-6} cm/sec.

Boring activities conducted on December 21, 1998 and December 22, 1998 revealed that the shallow confining layer (peat) was not 3 feet thick and/or continuous along the proposed alignment for the PDM key. Therefore, as stipulated in the PDM Key Investigation letter report[22], it was recommended that the PDM key be installed up to 1 foot into the shallow confining unit.

SK Services commenced construction of the PDM key on June 29, 1999 using PDM as the "low permeability" fill material. The construction sequence involved excavating dike material in-board and adjacent to the Steel sheet pile wall to expose the shallow confining unit, verifying that the surface of the shallow confining layer was free of extraneous material, and placing and compacting PDM in the trench using a remote vibratory sheepsfoot roller or, where practicable, conventional compaction equipment. In accordance with Quality Control (QC) activities required by the NJDEP, undisturbed samples (shelby tubes) of the compacted PDM were collected at a minimum frequency of 1 sample every 500 lineal feet of trench and tested for hydraulic conductivity in accordance with ASTM D5084. As of July 19, 1999, approximately 400 linear feet of the PDM key was installed; however, the results of four (4) permeability tests revealed that the compacted PDM did not meet the maximum permeability requirement of 1×10^{-6} cm/sec.

In order to achieve permeability requirements, SK Services proposed using clay as a substitute for PDM to construct the "PDM key". SK Services also proposed to construct the PDM key such that the top elevation of the barrier was a minimum of 1 foot higher than the peak groundwater elevations observed in the vicinity of the Steel sheet pile wall. The NJDEP verbally-approved the use of clay as a substitute for PDM, and agreed to the proposed top elevation of the PDM key. Construction resumed on July 20, 1999. The PDM key installed prior to July 20, 1999 was removed and replaced with the compacted clay material.

Activities Completed

Construction of the PDM key using clay was completed between stations 0+00 and 19+00 and between stations 31+75 and 35+25 (2,250 linear feet, total). The top of the PDM key was placed at a minimum elevation of one foot higher than the maximum groundwater elevation observed at each station. The last day of Site activities involving PDM key construction took place on August 20, 1999. The as-built location of the installed PDM key is shown on Drawings RAR-D3, D4, and D7 in Volume II-A of the RAR and PR. Documentation, including daily CQA logs of the PDM key installation, has also been provided in Volume II-B of the RAR and PR.

Activities Remaining

Two sections of the existing PDM key failed to meet permeability requirements and will need to be repaired. This will include the removal and replacement of the PDM key between stations

22 Key Environmental, Inc., January 1999, *PDM Key Investigation*, Former Koppers Seaboard Site, Kearny, New Jersey.

5+25 and 6+75 and between 9+00 and 9+50. Also, permeability testing will need to be completed at stations 9+00 and 9+50 to verify the extent of repairs needed.

Approximately 1,600 linear feet of the PDM key, from station 19+00 to 31+75 and from station 35+25 to 38+50, remains to be installed to meet the RAWP requirements. Beazer may propose to complete that barrier as a slurry wall.

3.4 GROUNDWATER MONITORED NATURAL ATTENUATION

As described in Section 2.0 above, one component of the Site remedy is groundwater natural attenuation. The RAWP established a groundwater monitoring plan for the shallow (fill unit) and deep zone (glacial till) aquifers to assess site related, as well as non-site related, COIs that have been detected in both the shallow and deep aquifers at concentrations greater than the New Jersey Class II-A Groundwater Quality Criteria (GWQC). Site-related COIs include organic constituents derived from coal tar chemicals and free cyanide. In summary the groundwater monitoring program includes:

- A natural attenuation performance monitoring plan for the fill unit groundwater;
- A dense non-aqueous phase liquid (DNAPL) monitoring plan; and,
- A deep-zone monitoring plan for deep-zone groundwater within the glacial till unit.

The results of the five years of groundwater monitoring to date indicate that no Site-related organic COIs were detected above applicable standards in either the shallow-zone compliance wells or the deep-zone compliance wells, with only one exception. High molecular weight polynuclear aromatic hydrocarbons (PAH) compounds have been detected in samples from shallow monitoring well P-19 at concentrations greater than surface water quality criteria (SWQC) for Class SE-2 surface water. However, the concentrations of these immobile constituents are consistent with historical pre-remediation results for this well and are believed to be attributable to the entrainment of suspended solids in the water sample. Additionally, shallow zone compliance well MW-113 which is hydraulically downgradient of P-19 did not contain detectable levels of PAH compounds above the GWQC or SWQC.

The natural attenuation and COI concentration data collected to date suggest that biodegradation is occurring in the Eastern portion of the Site. As a result, after the first eight quarters of monitoring, the NJDEP granted a request for a reduction in the frequency of sampling from quarterly to semi-annual monitoring.

4.0 CERTIFICATIONS

In accordance with 7.26E - 1.5, Beazer East, Inc. is hereby submitting the following signatures and notarized two-part certification, for this Remedial Action Report.

TYPE OF DOCUMENT: Remedial Action Report - Volumes I, II & III

CASE NAME: Koppers Seaboard Site **CASE NUMBER:** NJD002445112

CASE ADDRESS: Fish House Road and Bellevue Turnpike, Kearny, NJ
Block 287, Lots 54, 55, 56, 60 61B, 61C, 62, 62R, 63, 70, 70R, 71, 71R, 73,
80

A. The following certification shall be signed by the highest ranking individual with overall responsibility for implementing the remediation of a Site:

"I certify under penalty of the law that the information provided in this document is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement that I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

PRINTED NAME: Mitchell D. Brourman **TITLE:** Environmental Manager

SIGNATURE: **DATE:** 9-29-2003

NOTARY SIGNATURE: **DATE:** 9-29-2003

Notarial Seal
Sally M. Karanzas, Notary Public
City Of Pittsburgh, Allegheny County
My Commission Expires Apr. 27, 2007
Member, Pennsylvania Association Of Notaries

B. The following certification shall be signed by:

1. For a corporation, by a principal executive officer of at least the level of vice president;
2. For a partnership or sole proprietorship, by a general partner or the proprietor, respectively;
3. For a municipality, State, Federal or other public agency, by either a principal executive officer or ranking elected official; or,
4. For persons other than 1 through 3 above, by the person with legal responsibility for the Site.

"I certify under penalty of law that I have examined and am personally familiar with the information submitted herein and all attached documents, and that based on my inquires of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement, which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

PRINTED NAME:	Robert S. Markwell	**TITLE:**	Vice President
SIGNATURE:	Robert S. Markwell	**DATE:**	09/29/03
NOTARY SIGNATURE:	Sally M. Karanzas	**DATE:**	9-29-03

Notarial Seal
Sally M. Karanzas, Notary Public
City Of Pittsburgh, Allegheny County
My Commission Expires Apr. 27, 2007
Member, Pennsylvania Association Of Notaries

FIGURES

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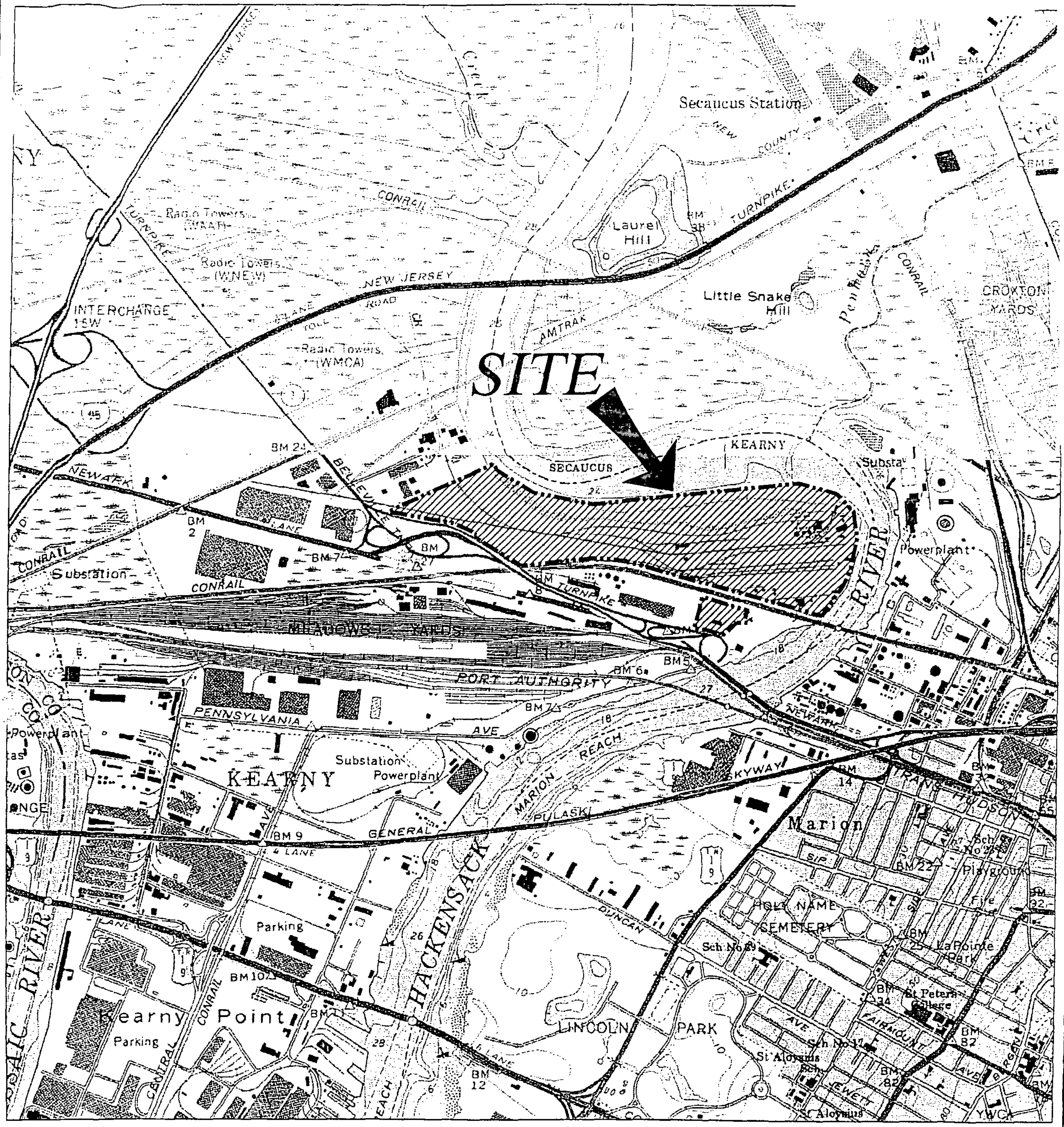

NEW JERSEY

QUADRANGLE LOCATION

REFERENCES: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLES OF JERSEY CITY, AND WEEHAWKEN, NJ-NY.

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA

DRWN:	ETF	DATE:	4/2/03
CHKD:	DIC	DATE:	4/2/03
APPD:	PWS	DATE:	4/2/03
SCALE:	AS SHOWN		

KEY ENVIRONMENTAL INCORPORATED

REMEDIAL ACTION REPORT
FORMER KOPPERS SEABOARD SITE, KEARNY, NEW JERSEY
NJDEP CASE No. NJ 002445112
BLOCK 287 LOTS 54, 55, 56, 60, 61B, 61C, 62, 62R, 63, 70, 70R, 71, 71R, 73, 80

ISSUE DATE:

ROSSLYN FARMS INDUSTRIAL PARK
1200 ARCH ST. SUITE 200
CARNEGIE, PA 15106

SITE LOCATION MAP

DRAWING NUMBER
03-630
FIGURE 1

FILE: \\ED_CAD_D\CE\BG\10\03-630\FIG_1LM.DWG

REMEDIAL ACTION REPORT
AND PROGRESS REPORT
VOLUME II - DRAWINGS AND PHOTOGRAPHS

FORMER KOPPERS SEABOARD SITE
KEARNY, NEW JERSEY

Prepared for:

Beazer East, Inc.

Prepared by:

Key Environmental, Inc.
1200 Arch Street, Suite 200
Carnegie, Pennsylvania 15106

October 2003

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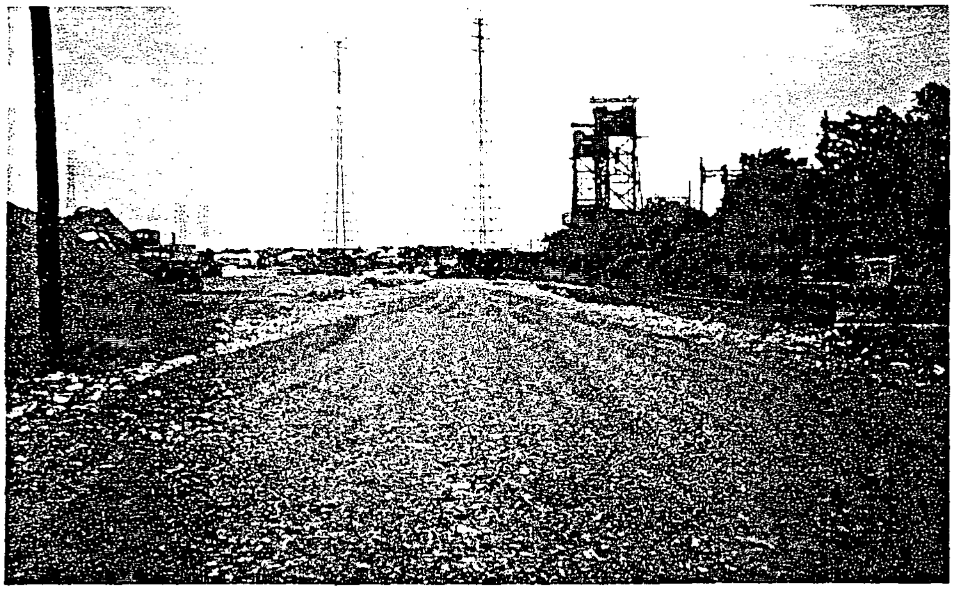
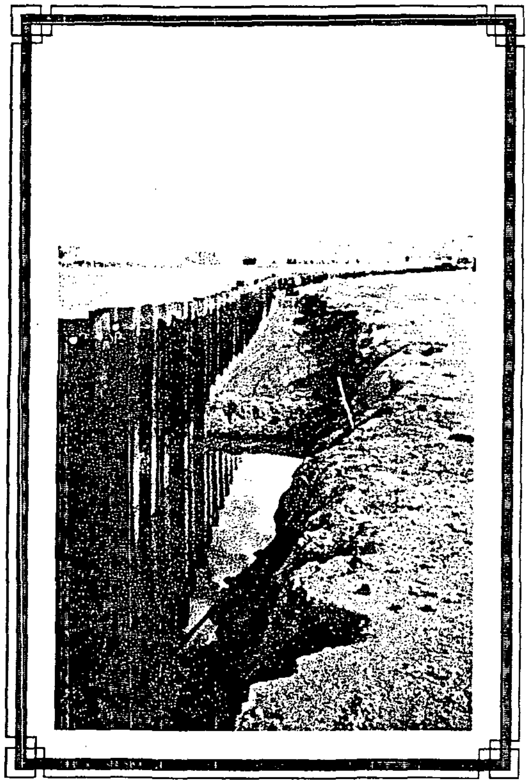


Photograph 1: Access Road Construction

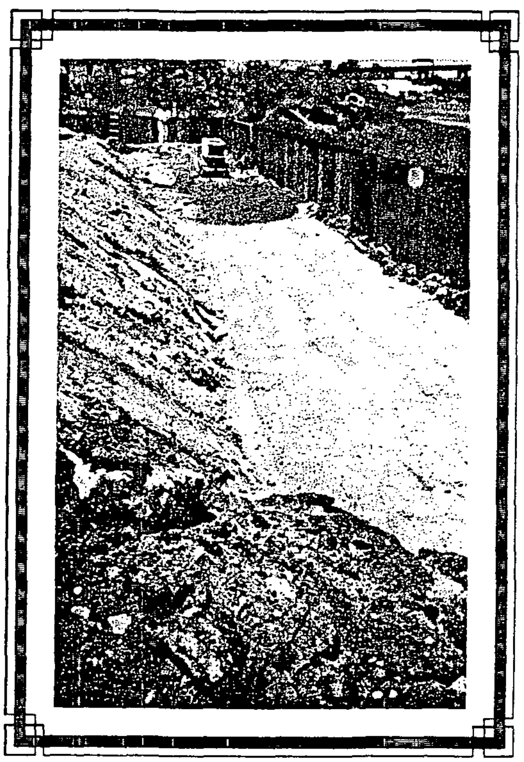
Photograph 2: Existing Dike

Photograph 3: Existing Sediment

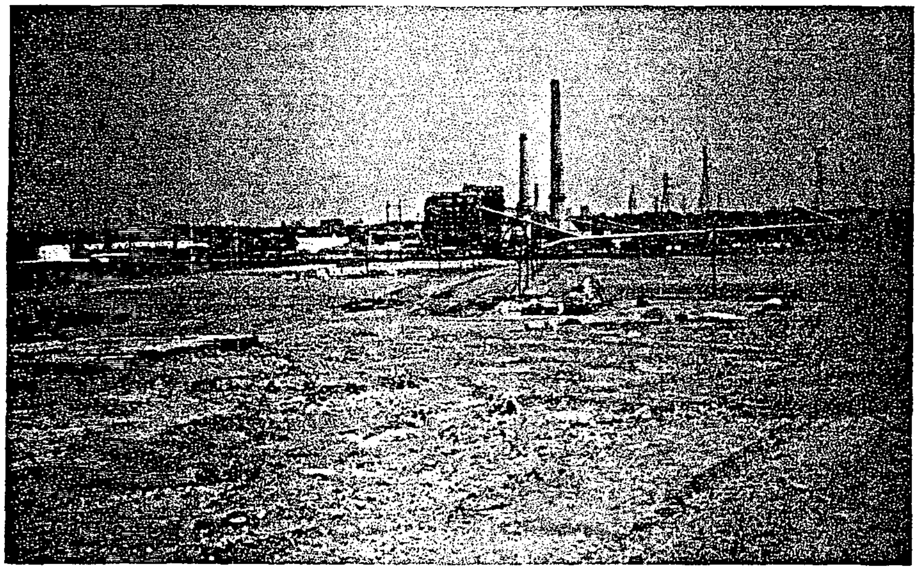
Photograph 4: PDM Key



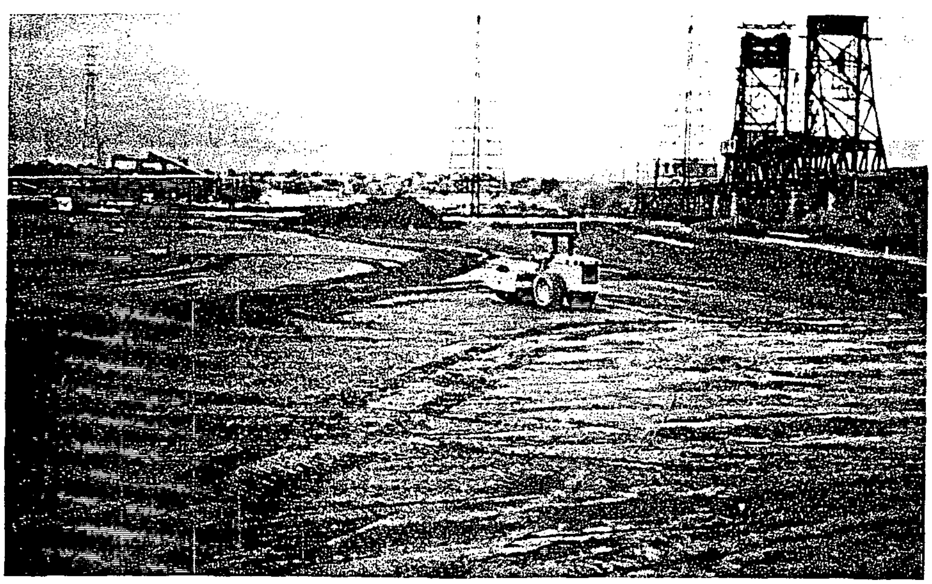
Photograph 5: PDM Key Construction



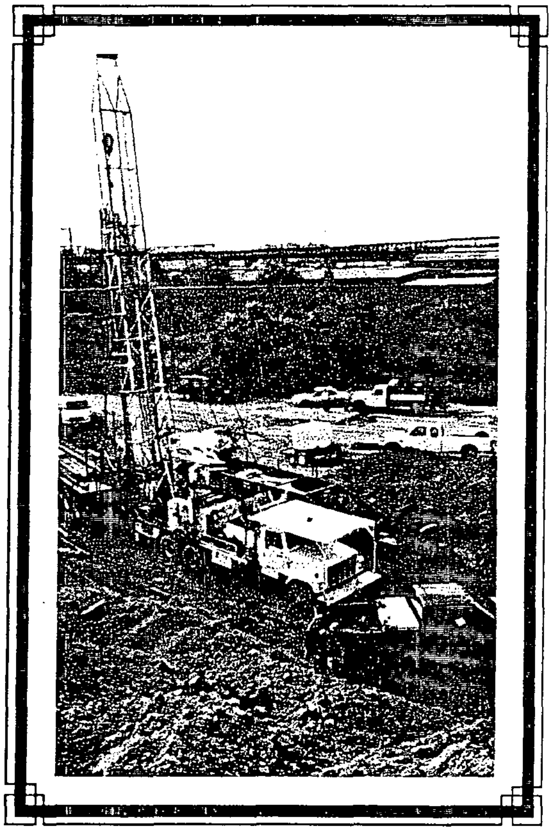
Photograph 6: PDM Key



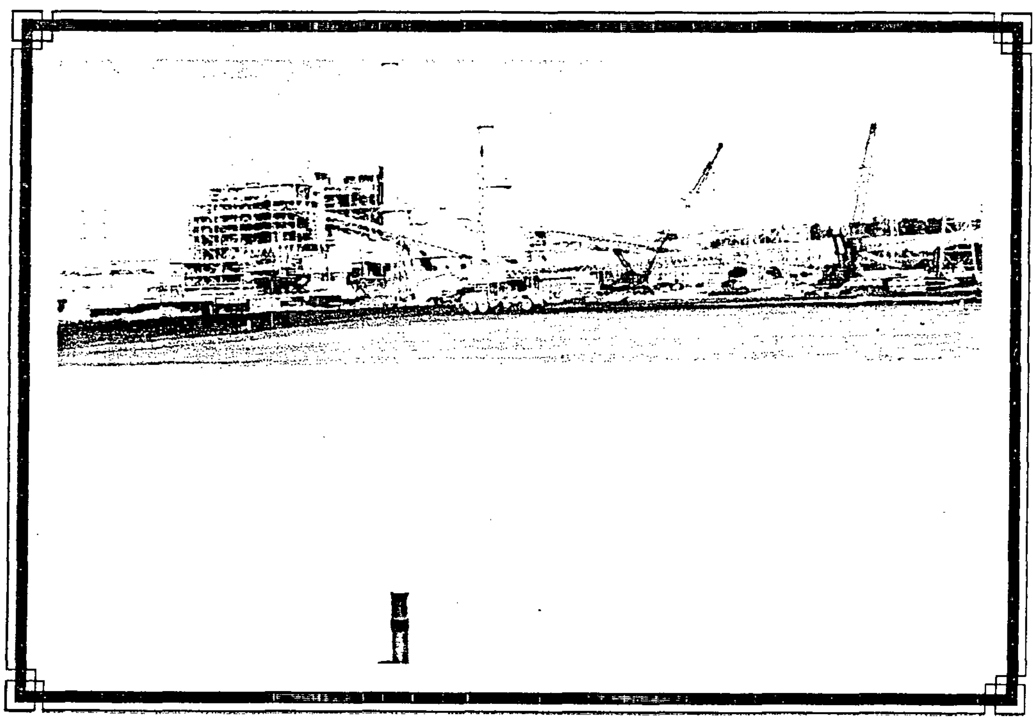
Photograph 7: PDM Placement



Photograph 8: PDM Placement

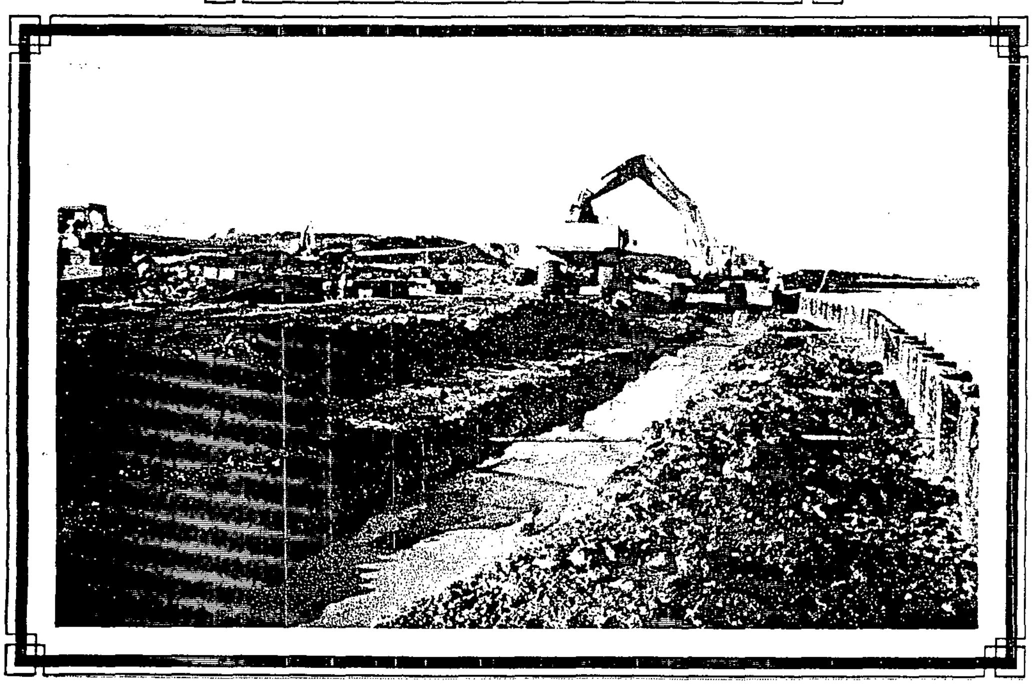


Photograph 9: Production Well Abandonment.



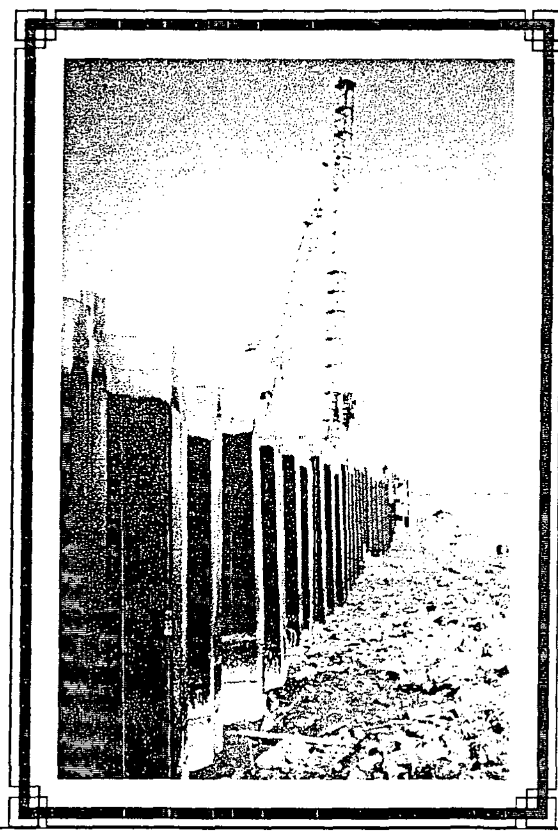
Photograph 10: Seaboard

Photograph 11: Slurry Wall Construction

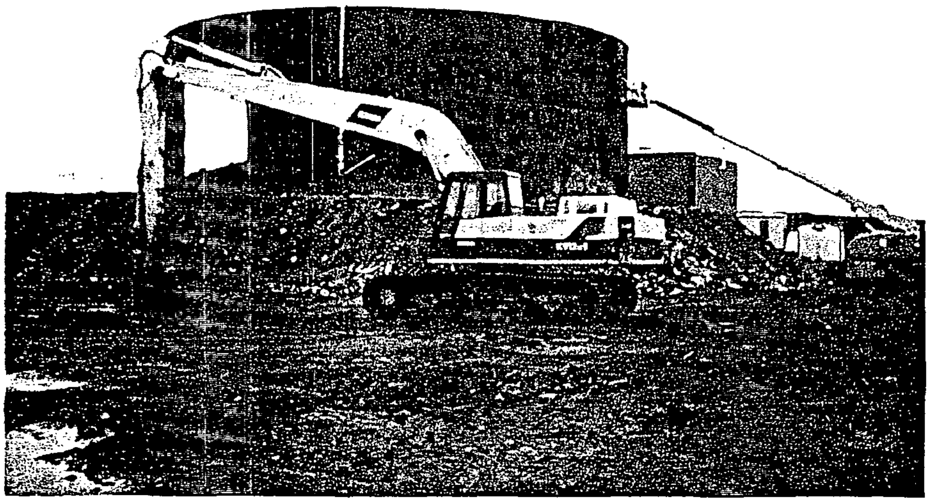


Photograph 12: Slurry Wall Construction

Photograph 13: Slurry Wall Construction



Photograph 14: SSP Wall Construction



Photograph 15: Tank Demolition

D39

C.N 028
nton, N.J. 08625-0028

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State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS WASTE MANAGEMENT

Michele M. Putnam
Deputy Director
Hazardous Waste Operations

John J. Trela, Ph.D., Director

Lance R. Miller
Deputy Director
Responsible Party Remedial Action

IN THE MATTER OF	:	AMENDMENT TO
BNS, INC. AND KOPPERS COMPANY, INC.	:	ADMINISTRATIVE
ECRA CASE #'s 88287, 88288,	:	CONSENT ORDER
88707 AND 88708	:	

The following FINDINGS are made and ORDER is issued pursuant to the authority vested in the Commissioner of the New Jersey Department of Environmental Protection (hereinafter "NJDEP") by N.J.S.A. 13:1D-1 et seq. and the Environmental Cleanup Responsibility Act, N.J.S.A. 13:1K-6 et seq.("ECRA"), and duly delegated to the Assistant Director for the Industrial Site Evaluation Element within the Division of Hazardous Waste Management pursuant to N.J.S.A. 13:1B-4.

FINDINGS

1. BNS, Inc. ("BNS") and Koppers Company, Inc. ("Koppers") entered into an Administrative Consent Order ("ACO") with NJDEP effective June 15, 1988, ECRA Case #'s 88287 and 88288 (the "BNS ACO") to allow BNS and Koppers to complete a stock tender offer ("Merger") prior to completion of the standard ECRA administrative process.

2. On June 24, 1988, Koppers entered into an agreement with Kop-Coat, Inc. ("Kop-Coat") to sell the assets of Koppers including the real property at the Newark and Westfield facilities, described in Attachment A of the BNS ACO to Kop-Coat, Inc. ("Kop-Coat Sale"). Kop-Coat, Inc. will continue Kopper's operations at the Newark and Westfield facilities.

3. Koppers has requested that NJDEP prepare an Amendment to the BNS ACO to include the Kop-Coat Sale and to allow the Kop-Coat Sale to be consummated prior to completion of the standard ECRA administrative process in accordance with the BNS ACO.

ORDER

BAA000002

NOW, THEREFORE, IT IS ORDERED AND AGREED THAT:

4. The provisions of this Amendment shall become part of the BNS ACO. The BNS ACO as amended, shall remain in full force and effect. The

Kop-Coat Sale may be consummated prior to the completion of the standard ECRA administrative process.

5. Paragraph 5.B of the BNS ACO shall be amended to read as follows:

B. Transaction:

i. Seller: Koppers Company, Inc., a Delaware Corporation
Buyer: BNS, Inc., a Delaware Corporation

Description: On March 3, 1988, BNS, Inc., commenced a stock tender offer for the stock of Koppers Company, Inc. BNS, Inc. intends to merge Koppers Company, Inc. into one or more wholly-owned subsidiaries of BNS, Inc. within one hundred and twenty (120) days of acceptance of the stock tender offer ("Merger"). As of the effective date of the Amendment to this ACO, this merger has not occurred. Upon completion of the Merger, Koppers Company, Inc. will be a subsidiary of BNS, Inc.

ii. Seller: Koppers Company, Inc., a Delaware Corporation
Buyer: Kop-Coat, Inc., a Delaware Corporation

Description: On June 24, 1988, Koppers entered into an agreement with Kop-Coat, Inc. ("Kop-Coat") to sell the assets of Koppers including the real property at the Newark and Westfield facilities, described in Attachment A of the BNS ACO to Kop-Coat, Inc. ("Kop-Coat Sale"). Kop-Coat, Inc. will continue Kopper's operations at the Newark and Westfield facilities.

6. "B" and "C" of Attachment A of the BNS ACO shall be amended to read as follows:

B. SIC #: 2899 Financial Assurance: $500,000.00
Facility Name: Koppers Co., Inc.
"Newark facility"

Facility Location: 480 Frelinghuysen Avenue
Newark City, Essex County

Block: 3511 Lots: 1, 4
Block: 3513 Lots: 3, 10

ECRA Case #88287 Initial Notice Status: Incomplete
ECRA Case #88707 Initial Notice Status: Incomplete
Owner and Operator: Koppers Company, Inc.

C. SIC #: 2952 Financial Assurance: $750,000.00
Facility Name: Koppers, Co., Inc.
"Westfield facility"

Facility Location: 449 South Avenue East
Westfield Town, Union County

Block: 503   Lots: 11, 12

ECRA Case #88288	Initial Notice Status:	Incomplete
ECRA Case #88708	Initial Notice Status:	Incomplete
Owner and Operator:	Koppers Company, Inc.	

7. The Ordered Parties shall complete the Initial Notice (commonly referred to as ECRA I and II) for ECRA case #'s 88707 and 88708 required by N.J.A.C. 7:26B-3 within thirty (30) days from the effective date of this ACO.

8. Within seven (7) days from the effective date of this Amendment, The Ordered Parties shall provide to NJDEP a copy of the written agreement between Koppers Company, Inc. and Kop-Coat, Inc.

9. The Ordered Parties agrees not to contest the authority or jurisdiction of the Department to issue this Amendment to the BNS ACO and also agrees not to contest the terms of this Amendment.

10. Any signatory to this Amendment to the BNS ACO, who is executing this Amendment to the BNS ACO on behalf of an entity other than that individual, shall provide to NJDEP appropriate documentary evidence as specified in N.J.A.C. 7:26B-1.13 authorizing the signatory to bind the entity to the provisions of this Amendment to the BNS ACO. This documentary evidence shall be submitted to NJDEP along with this executed Amendment to the BNS ACO.

11. Any Ordered Party to this Amendment to the BNS ACO shall provide to NJDEP at least thirty (30) days prior written notice of the dissolution of its corporate identity or liquidation of its assets, and shall provide immediate written notice to NJDEP of filing of a petition for bankruptcy no later than the day after filing. Upon receipt of notice of dissolution of corporate identity, liquidation of assets or filing of a petition for bankruptcy, NJDEP may request and within fourteen (14) days of NJDEP's written request an Ordered Party shall obtain and submit to NJDEP, additional financial assurance pursuant to this ACO.

12. This Amendment shall take effect upon the execution of this Amendment by the parties. This Amendment shall be null and void unless The Ordered Parties submit this signed Amendment to NJDEP within thirty (30) days of signing of this Amendment by NJDEP. Upon the effective

date of this Amendment. The Ordered Parties may complete the Kop-Coat Sale. The Ordered Parties shall submit a fully executed Amendment to NJDEP within one (1) business day from the effective date.

NEW JERSEY DEPARTMENT
OF ENVIRONMENTAL PROTECTION

Date: 9-5-88

By:
JOSEPH R. FALLON, ASSISTANT DIRECTOR
INDUSTRIAL SITE EVALUATION ELEMENT

BNS, INC.
(Ordered Party)

Date: August 29, 1988

By:

Name: Brian C. Beazer

Title: President

KOPPERS COMPANY, INC.
(Ordered Party)

Date: August 29, 1988

By:

Name: Jill M. Blundon

Title: Vice President, General Counsel & Secretary

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CN 028
Trenton, N.J. 08625-0028

(609)633-7141

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS WASTE MANAGEMENT

Michelle N. Putnam
Deputy Director
Hazardous Waste Operations

John J. Trela, Ph.D., Director

Lance R. Miller
Deputy Director
Responsible Party Remedial Action

IN THE MATTER OF	:	ADMINISTRATIVE
BNS, INC. AND	:	CONSENT ORDER
KOPPERS COMPANY, INC.	:	
ECRA CASE #'s 88286, 88287, 88288	:	

The following FINDINGS are made and ORDER is issued pursuant to the authority vested in the Commissioner of the New Jersey Department of Environmental Protection (hereinafter "NJDEP") by N.J.S.A. 13:1D-1 et seq. and the Environmental Cleanup Responsibility Act, N.J.S.A. 13:1K-6 et seq., and duly delegated to the Assistant Director for the Industrial Site Evaluation Element within the Division of Hazardous Waste Management pursuant to N.J.S.A. 13:1B-4.

FINDINGS

1. The Environmental Cleanup Responsibility Act, N.J.S.A. 13:1K-6 et seq. ("ECRA" or "the Act"), was signed into New Jersey state law by Governor Thomas H. Kean on September 2, 1983, and took effect on December 31, 1983.

2. ECRA required the NJDEP to adopt rules and regulations to implement the Act. On December 21, 1987, NJDEP adopted the Final ECRA Regulations, N,J.A.C. 7:26B ("Regulations") in compliance with the Administrative Procedure Act, N.J.S.A. 52:14B-1 et seq., upon acceptance for filing by the Office of Administrative Law pursuant to N.J.A.C. 1:30-4.4(d). On January 1, 1988, the Regulations became effective and concurrently repealed N.J.A.C. 7:1-3, the Interim ECRA Regulations.

3. ECRA requires that the owner or operator of an industrial establishment planning to sell or close or transfer operations (a) notify the NJDEP in writing within five (5) days of the execution of the agreement of sale or public release of its decision to close pursuant to N.J.A.C. 7:26B-1.6, (b) submit within sixty (60) days prior to transfer of title or closing operations, a Negative Declaration or Cleanup Plan to the NJDEP for approval, and (c) obtain, upon approval of any necessary Cleanup Plan by the NJDEP, a surety bond or other financial security approved by the NJDEP guaranteeing performance of the Cleanup Plan in an amount equal to the cost estimate for the approved Cleanup Plan.

4. N.J.S.A. 13:1K-13 provides that failure to submit a Negative Declaration or Cleanup Plan pursuant to ECRA is grounds for voiding the sale by NJDEP. Any person who knowingly gives or causes to be given any false information or who fails to comply with the provisions of

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ECRA is liable for a penalty of not more than $25,000.00 for each occurrence, and each day of a violation of a continuing nature constitutes an additional and separate offense as specified in N.J.A.C. 7:26B-9.3. Furthermore, any officer or management official of an industrial establishment who knowingly directs or authorizes the violation of any provisions of the Act shall be personally liable for the $25,000.00 penalties for each violation described above.

5. On March 7, 1988, BNS, Inc. ("Ordered Party") submitted to NJDEP an application for an Administrative Consent Order ("ACO") pursuant to N.J.A.C. 7:26B-7.2. The ACO application is incorporated herein by reference and includes the following information:

A. Industrial Establishments: See Attachment A

B. Transaction:

Seller: Koppers Company, Inc. ("Ordered Party"), a Delaware Corporation
Buyers: BNS, Inc., a Delaware Corporation

Description:

On March 3, 1988, BNS, Inc., commenced a stock tender offer for the stock of Koppers Company, Inc. BNS, Inc. intends to merge Koppers Company, Inc. into one or more wholly-owned subsidiaries of BNS, Inc. within one hundred and twenty (120) days of acceptance of the stock tender offer ("Merger"). Upon completion of the Merger, Koppers Company, Inc. will be a subsidiary of BNS, Inc.

6. The Transaction described in Paragraph 5.B. above is the sale, transfer and/or closing of Industrial Establishments as defined by ECRA and the Regulations. NJDEP and the Ordered Party(ies) expressly agree that the Transaction is subject to ECRA and the Regulations. The Ordered Party(ies) has requested that NJDEP prepare an ACO which, when effective, will allow the Transaction to be consummated prior to the completion of all administrative requirements.

7. In circumstances as referenced in N.J.A.C. 7:26B-7.1(a) through 10, NJDEP, in its discretion, may enter into an ACO so that the closing, terminating or transferring of operations may occur prior to completing the ECRA obligations. The ACO specifies a time schedule for completion of ECRA requirements by the Ordered Party(ies) and provides for financial assurance in a form and amount acceptable to NJDEP prior to consummation of any transactions subject to ECRA. Failure to fully comply with all the terms and conditions of the ACO shall subject the Ordered Party(ies) to the full range of penalties and remedies prescribed in the Act, the Regulations, specifically N.J.A.C. 7:26B-9.3 and the ACO.

ORDER

NOW, THEREFORE, IT IS ORDERED AND AGREED THAT:

8. NJDEP and the Ordered Party(ies) expressly agree that the terms and conditions of this ACO, including the financial assurance requirements, set forth in Paragraphs 9, 10, 11, and 19 below, shall apply separately to each of the Ordered Party(ies) facilities. Furthermore, NJDEP and the Ordered Party(ies) agree to administer and complete all applicable ECRA program requirements, including exercise of the financial assurance requirements and any other remedial measures pursuant to the ACO and ECRA, separately for each subject Industrial Establishment.

9. ECRA Program Requirements for the Ordered Party(ies) Facilities

   A. The Ordered Party(ies) shall complete the Initial Notice (commonly referred to as ECRA I and ECRA II) for each subject Industrial Establishment required by N.J.A.C. 7:26B-3 within forty-five (45) days for the Newark facility, sixty (60) days for the Port Newark facility, and seventy-five (75) days for the Westfield facility, from the effective date of this ACO.

   B. Within one hundred twenty (120) days from receipt of NJDEP's written approval of the Sampling Plan(s) prepared pursuant to N.J.A.C. 7:26B-3.2(b)11 and N.J.A.C. 7:26B-4.2, the Ordered Party(ies) shall initiate, complete, and submit to NJDEP the results from any NJDEP-approved Sampling Plan(s) including, but not limited to, complete delineation of environmental contamination on-site, and any off-site environmental contamination resulting from discharges of hazardous wastes or substances on or from the Industrial Establishment. These results shall be accompanied by a proposed negative declaration, cleanup plan or revised sampling plan pursuant to 7:26B-4.3. Any negative declaration or cleanup plan submitted to NJDEP shall conform to 7:26B-5.

   C. NJDEP and the Ordered Party(ies) recognize that additional sampling may be necessary during the various stages of the implementation of this ACO and ECRA, including during the implementation of a Cleanup Plan(s), at any of the subject Industrial Establishments to delineate fully the nature and extent of environmental contamination on-site, and any off-site environmental contamination resulting from discharges of hazardous substances or wastes on or from any of the subject Industrial Establishments. Therefore, the Ordered Party(ies) agrees to submit any additional sampling plans for NJDEP review and approval required by NJDEP in writing during the various stages of the implementation of this ACO and ECRA, including during the implementation of a Cleanup Plan(s), to further delineate the nature and extent of environmental contamination on or from any of the subject Industrial Establishments. NJDEP and the Ordered Party(ies) mutually agree that the Ordered Party(ies) shall submit to NJDEP any required additional sampling plans for review and approval within thirty (30) days of the receipt of said written request. Within ninety (90) days from receipt of NJDEP's written approval of any additional sampling plans(s), the Ordered Party(ies) shall initiate, complete and submit to NJDEP the results from any additional NJDEP-approved Sampling Plan(s) required pursuant to this paragraph accompanied by a proposed negative declaration, cleanup plan, or revised sampling plan pursuant to N.J.A.C. 7:26B-4.3.

D. The Ordered Party(ies) shall implement any NJDEP-approved Cleanup Plan(s) in accordance with the approved time schedule or defer implementation of all or part of the Cleanup Plan(s) subject to NJDEP approval pursuant to N.J.A.C. 7:26B-5.5.

E. Should NJDEP determine that any submittal made under Paragraph 9 of this ACO is inadequate or incomplete, then NJDEP shall provide the Ordered Party(ies) with written notification of the deficiency(ies), and the Ordered Party(ies) shall revise and resubmit the required information within a reasonable period of time not to exceed thirty (30) days from receipt of such notification.

F. All submissions required pursuant to Paragraph 9 or any other provision of this ACO shall be accompanied by all appropriate fees required pursuant N.J.A.C. 7:26B-1.10.

10. Conditions for Financial Assurance

A. The Ordered Party(ies) shall obtain and provide to NJDEP separate financial assurances in forms acceptable to NJDEP for each subject Industrial Establishment in the amounts specified in Attachment A. The financial assurances must conform with the requirements of N.J.S.A. 13:1K-9(b)3, N.J.A.C. 7:26B-6 and this ACO. These financial assurances shall be submitted to NJDEP within seven (7) business days from the effective date of this ACO.

B. The Ordered Party(ies) shall establish and submit to NJDEP for each subject Industrial Establishment separate standby trust funds pursuant to N.J.A.C. 7:26B-6.7 within seven (7) days from the effective date of this ACO. The financial institution(s) which issue the financial assurance(s) shall agree to promptly and directly deposit all amounts up to the total value of the financial assurance(s) into the standby trust fund(s) upon demand by NJDEP.

C. Upon NJDEP approval of a Cleanup Plan(s) for any of the subject Industrial Establishments, the Ordered Party(ies) shall amend the amount of the financial assurance(s), specified in Attachment A for any or all of the Ordered Party(ies')'s facilities as the case may be, to equal the estimated cost of implementation of the approved Cleanup Plan(s), or shall provide such other financial assurance(s) as may be approved by NJDEP in an amount(s) equal to the estimated cost of implementation of the approved Cleanup Plan(s).

D. In the event that NJDEP determines that the Ordered Party(ies) has failed to perform any of its obligations under this ACO or ECRA, at any of the Ordered Party(ies')'s facilities, NJDEP may draw on the financial assurance(s) for that subject Industrial Establishment(s); provided, however, that before any such demand is made, NJDEP shall notify the Ordered Party(ies) in writing of the obligation(s) with which it has not complied, and the Ordered Party(ies) shall have reasonable time, not to exceed fourteen (14) days, to perform such obligation(s) to NJDEP's satisfaction. Nothing in this paragraph shall prevent NJDEP from collecting stipulated penalties pursuant to the terms of this ACO for cause.

E. Upon NJDEP's written approval of a Negative Declaration(s), the Ordered Party(ies) shall be relieved of any further obligation to maintain in full force and effect the financial assurance(s) required by this ACO for the facility(ies) which is the subject of the NJDEP-approved Negative Declaration(s). Upon NJDEP's written approval of the completion of any cleanup(s) required by this ACO, as verified by final site inspection(s) pursuant to N.J.A.C. 7:26B-5.7, and upon the Ordered Party(ies')'s satisfaction of all financial obligations in connection therewith, the Ordered Party(ies) shall be relieved of any further obligation to maintain in full force and effect the financial assurance(s) required by this ACO for the facility(ies) at which the approved cleanup(s) has been completed.

11. Additional Conditions of Consent

A. The Ordered Party(ies) shall allow NJDEP access to each subject Industrial Establishment(s) pursuant to N.J.A.C. 7:26B-1.12 for the purpose of undertaking all necessary monitoring and environmental cleanup activities. The Ordered Party(ies) has provided NJDEP with appropriate documentation that the Buyer shall allow the NJDEP access required herein.

B. Compliance with the terms of this ACO shall not excuse the Ordered Party(ies) from obtaining and complying with any applicable federal, state or local permits, statutes, regulations and/or orders while carrying out the obligations imposed by ECRA through this ACO. The execution of this ACO shall not excuse the Ordered Party(ies) from compliance with all other applicable environmental permits, statutes, regulations and/or orders and shall not preclude NJDEP from requiring that the Ordered Party(ies) obtain and comply with any permits, and/or orders issued by NJDEP under the authority of the Water Pollution Control Act, N.J.S.A. 58:10A-1 _et seq._, the Solid Waste Management Act, N.J.S.A. 13:1E-1 _et seq._, and the Spill Compensation and Control Act ("Spill Act") N.J.S.A. 58:10-23.11 _et seq._, for the matters covered herein. The terms and conditions of any such permit shall not be preempted by the terms and conditions of this ACO if the terms and conditions of any such permit are more stringent than the terms and conditions of this ACO. Should any of the measures to be taken by the Ordered Party(ies) during the remediation of any ground water and surface water pollution result in a new or modified discharge as defined in the New Jersey Pollutant Discharge Elimination System ("NJPDES") regulations, N.J.A.C. 7:14A-1 _et_ _seq_., then the Ordered Party(ies) shall obtain a NJPDES permit or permit modification from NJDEP prior to commencement of said activity.

C. NJDEP reserves the right to stop any construction, improvement(s), or change(s) at the Industrial Establishment(s) subject to this ACO, due to the presence of hazardous substances or wastes, the disturbance of which, prior to implementation of NJDEP-approved Cleanup Plan, has the potential to cause harm to public health, safety and welfare as determined by the NJDEP.

D. NJDEP agrees that it will not bring any action, nor will it recommend that the Attorney General's Office bring any action, including monetary penalties, for the Ordered Party's(ies') failure to comply with (a) the time requirements in N.J.S.A. 13:1K-9(b)1 that NJDEP be notified within five (5) days of execution of an agreement of sale or public release of its decision to close, and (b) the time requirement in N.J.S.A. 13:1K-9(b)2 that a Negative Declaration or Cleanup Plan be submitted sixty (60) days prior to transfer of title or closing operations for the transaction described in paragraph 5.B above.

E. No obligations imposed by this ACO (other than by Paragraph 11.G below) are intended to constitute a debt, claim, penalty or other civil action which could be limited or discharged in a bankruptcy proceeding. All obligations imposed by this ACO shall constitute continuing regulatory obligations imposed pursuant to the police power of the State of New Jersey, intended to protect the public health, safety and welfare.

F. This ACO imposes certain requirements and deadlines upon the Ordered Party(ies). The Ordered Party(ies) agrees to use its best efforts to comply with said requirements and NJDEP agrees not to act unreasonably in the enforcement and implementation of this ACO.

G. In the event that the Ordered Party(ies) fails to comply with any of the provisions of this ACO, the Ordered Party(ies) shall pay to NJDEP stipulated penalties in the amount not less than $1,000.00 nor more than $5,000.00 as specified in N.J.A.C. 7:26B-7.4(a) for each of the subject Industrial Establishments for each day on which the Ordered Party(ies) fails to comply with any obligation under this ACO. No such stipulated penalty shall be payable by the Ordered Party(ies) with respect to such period that said failure to comply results from _Force Majeure_. The Ordered Party(ies) waives its rights to contest NJDEP's exercise of discretion concerning the amount of any penalty assessed by NJDEP pursuant to N.J.A.C 7:26B-9.3 and N.J.A.C. 7:26B-7.4(b).

H. The provisions of this ACO shall be binding upon the Ordered Party(ies) and its successors in interest, assigns, tenants, and any trustee in bankruptcy or receiver appointed pursuant to a proceeding in law or equity. Any officer or management official of the Ordered Party(ies) who knowingly directs or authorizes the violation of any provision of ECRA or the Regulations shall be personally liable for the penalty established pursuant to N.J.S.A. 13:1K-13 and N.J.A.C. 7:26B-9.3.

I. Any signatory to this ACO, who is executing this ACO on behalf of an entity other than that individual, shall provide to NJDEP appropriate documentary evidence as specified in N.J.A.C 7:26B-7.5 authorizing the signatory to bind the entity to the provisions of this ACO. This documentary evidence shall be submitted to NJDEP along with a fully executed ACO pursuant to Paragraph 19.A of this ACO.

J. NJDEP and the Ordered Party(ies) expressly agree that NJDEP will not exercise its right to void the transfer of any or all of the subject Industrial Establishments, as the case may be, included in the Transaction described in Paragraph 5.B above, except in the event that the Ordered Party(ies) fails to submit an approvable Negative Declaration(s) or Cleanup Plan(s) for that facility(ies) pursuant to Paragraph 9.D above. NJDEP's right to void the subject sale or transfer shall terminate upon NJDEP's written approval of an appropriate Negative Declaration(s) or Cleanup Plan(s) for any or all of the subject Industrial Establishments, as the case may be, submitted by the Ordered Party(ies) pursuant to this ACO and ECRA.

K. Any Ordered Party to this ACO shall provide to NJDEP at least thirty (30) days prior written notice of the dissolution of its corporate identity or liquidation of its assets, and shall provide immediate written notice to NJDEP of filing of a petition for bankruptcy no later than the day after filing. Upon receipt of notice of dissolution of corporate identity, liquidation of assets or filing of a petition for bankruptcy, NJDEP may request and within fourteen (14) days of NJDEP's written request the Ordered Party(ies) shall obtain and submit to NJDEP, additional financial assurance pursuant to this ACO.

L. Any submission to be made to NJDEP in accordance with this ACO shall be directed to:

Joseph R. Fallon, Assistant Director
Industrial Site Evaluation Element
Division of Hazardous Waste Management
CN 028
Trenton, NJ 08625

12. Force Majeure

If any fire, flood, storm, riot, strike, or other circumstance determined by NJDEP to be beyond the control of the Ordered Party(ies) occurs which causes or may cause delays in the achievement of any deadline contained in this ACO, the Ordered Party(ies) shall notify NJDEP in writing within ten (10) days of the delay or anticipated delay, as appropriate, referencing this Paragraph and describing the anticipated length, precise cause or causes, measures taken or to be taken and the time required to minimize the delay. The Ordered Party(ies) shall adopt all necessary measures to prevent or minimize any delay. If any delay or anticipated delay has been or will be caused by fire, flood, storm, riot, strike or other circumstances determined by NJDEP to be beyond the control of the Ordered Party(ies), then the time for performance hereunder shall be extended by NJDEP for a period no longer than the delay resulting from such circumstances, provided that NJDEP may grant additional extensions for good cause. If the events causing such delay are not found by NJDEP to be beyond the control of the Ordered Party(ies), failure to comply with the provisions of the ACO shall constitute a breach of the ACO's requirements. The burden of proving that any delay is caused by circumstances beyond the Ordered Party(ies')'s control and the length of such delay attributable to those circumstances shall rest with the Ordered Party(ies). Increases in the costs or expenses incurred in fulfilling the requirements contained herein shall not be a basis for an extension of time. Similarly, delay in completing an interim requirement shall not automatically justify or excuse delay in the attainment of subsequent requirements.

13. Reservation of Rights

This ACO shall be fully enforceable in the New Jersey Superior Court having jurisdiction over the subject matter and signatory parties upon the filing of a summary action for compliance pursuant to ECRA. This ACO may be enforced in the same manner as an Administrative Order issued by NJDEP pursuant to other statutory authority and shall not preclude NJDEP from taking whatever action it deems appropriate to enforce the environmental protection laws of the State of New Jersey. It is expressly recognized by NJDEP and the Ordered Party(ies) that nothing in this ACO shall be construed as a waiver by NJDEP of its rights with respect to enforcement of ECRA on bases other than those set forth in the ECRA Program Requirements section of this ACO or by the Ordered Party(ies) of its right to seek review of any enforcement action as provided by the Administrative Procedure Act, N.J.S.A. 52:14B-1 et seq. Furthermore, nothing in this ACO shall constitute a waiver of any statutory right of NJDEP to require the Ordered Party(ies) to implement additional remedial measures should NJDEP determine that such measures are necessary to protect the public health, safety and welfare.

14. The Ordered Party(ies) agrees not to contest the authority or jurisdiction of the Department to issue the ACO and also agrees not to contest the terms of this ACO.

15. The execution of this ACO shall not release The City of Newark from any responsibilities The City of Newark has pursuant to ECRA and the Regulations. NJDEP may exercise its discretion as to enforcement of the ACO and enforcement of the statutory obligation of The City of Newark under ECRA and the Regulations.

16. NJDEP and The Ordered Parties agree that the Transaction described in Paragraph 5.B above will constitute a change in ownership which would

trigger ECRA applicability for the facilities listed in Attachment A. In the event that the tender offer portion of the Transaction described in Paragraph 5.B above is not consummated and no change in ownership occurs, NJDEP recognizes that there will be no trigger for ECRA to apply to the facilities listed in Attachment A and, therefore, this ACO will become null and void.

17. NJDEP and The Ordered Parties expressly agree that NJDEP shall allow The Ordered Parties to complete the Merger within sixty (60) days of the effective date of this ACO, without requiring The Ordered Parties to amend this ACO to include the Merger. In the event that The Ordered Parties does not complete the Merger within this time period, The Ordered Parties shall enter into an amendment to this ACO prior to The Ordered Parties' completion of the Merger.

18. Responsibility of the Ordered Parties

A. The Ordered Parties have informed NJDEP that BNS, Inc. shall be the lead party for contact with NJDEP and for compliance with the terms and conditions of this ACO. NJDEP and the Ordered Parties have agreed that the Ordered Parties shall be responsible, each of them jointly, severally and individually, for performance of all obligations listed in this ACO.

B. NJDEP and the Ordered Parties mutually agree that in the event that BNS, Inc. or Koppers Company, Inc. fails or refuses to perform any ECRA obligations, as determined by NJDEP, NJDEP may exercise full discretion concerning the ECRA obligations of the Ordered Parties for ECRA compliance. The Ordered Parties expressly agree that in the event that BNS, Inc. or Koppers Company, Inc. fails or refuses to perform any obligation(s) under this ACO as determined by NJDEP, NJDEP shall have the right to exercise any option or combination of options available to NJDEP under this ACO, ECRA, the Regulations or any other statute to ensure full and complete ECRA compliance by BNS, Inc. and/or Koppers Company, Inc.

19. A. This ACO shall be effective upon the execution of this ACO by the NJDEP and the Ordered Party(ies). The Ordered Party(ies) shall return a fully executed ACO to NJDEP together with signature authorization required within one (1) business day from the effective date.

B. This ACO shall be null and void unless executed by the Ordered Party(ies) within 30 days of NJDEP signing.

C. Upon the effective date of this ACO, the Ordered Party(ies) may complete the Transaction described in Paragraph 5.B above subject to the conditions of this ACO.

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

Date: 6-13-88

By: ______________________
JOSEPH R. FALLON, ASSISTANT DIRECTOR
INDUSTRIAL SITE EVALUATION ELEMENT

BNS, INC.
(Ordered Party)

Date: 6/15/88

By: ______________________

Name: Brian C. Beazer

Title: President

KOPPERS COMPANY, INC.

(Ordered Party)

Date: 6/15/88

By: ______________________

Name: Glen C. Tenley

Title: President

ATTACHMENT A

A. ECRA Case #88286 SIC #: 2861 Financial Assurance: $500,000.00
Facility Name: Koppers Co., Inc.
"Port NEWARK facility"

Facility Location: Maritime & Tyler Streets
Newark City, Essex County

Block: 6000 Lot: 40

Initial Notice Status: Incomplete

Owner: City of Newark
Operator: Koppers Company, Inc.

B. ECRA Case #88287 SIC #: 2899 Financial Assurance: $500,000.00
Facility Name: Kopper Co., Inc.
"Newark facility"

Facility Location: 480 Frelinghuysen Avenue
Newark City, Essex County

Block: 3511 Lots: 1, 4
Block: 3513 Lots: 3, 10

Initial Notice Status: Incomplete
Owner and Operator: Koppers Company, Inc.

C. ECRA Case #88288 SIC #: 2952 Financial Assurance: $750,000.00
Facility Name: Koppers, Co., Inc.
"Westfield facility"

Facility Location: 449 South Avenue East
Westfield Town, Union County

Block: 503 Lots: 11, 12

Initial Notice Status: Incomplete

Owner and Operator: Koppers Company, Inc.

D40

Decide with Confidence

Business Information Report

To save report(s) to your PC, click here for instructions. Print this Report

ATTN: **MM**

Report Printed: JUN 16 2004
In Date

BUSINESS SUMMARY

BEAZER EAST INC
(SUBSIDIARY OF HANSON BUILDING MATERIALS AMERICA INC, NEPTUNE, NJ)
1 Oxford Center Ste 3000
Pittsburgh, PA 15219

Now Included with this Report NEW!

D&B's Credit Limit Recommendation
D&B's industry and risk-based limit guidance
Learn More View Now

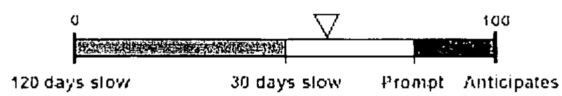
Payment Trends Profile
Payment trends and industry benchmarks
Learn More View Now

This is a **headquarters (subsidiary)** location.
Branch(es) or division(s) exist.

Web site:	www.hanson-america.com
Telephone:	412 208-8819
Fax:	412 227-2950
Chief executive:	KAREN MANCE, V PRES-TREAS-CFO
Year started:	1944
Management control:	1999
Employs:	Undetermined (Undetermined here)
History:	CLEAR
SIC:	4959
Line of business:	Environmental cleanup

D-U-N-S Number:	00-433-4942
D&B Rating:	--
D&B PAYDEX®:	

12-Month D&B PAYDEX: 59
When weighted by dollar amount, payments to suppliers average 23 days beyond terms.



Based on trade collected over last 12 months.

NEW! Enhanced payment trends and industry benchmarks are available on this business

SUMMARY ANALYSIS

BAC000002

D&B Rating:--

The blank rating symbol should not be interpreted as indicating that credit should be denied. It simply means that the information available to D&B does not permit us to classify the company within our rating key and that further enquiry should be made before reaching a decision. Some reasons for using a "-" symbol include: deficit net worth, bankruptcy proceedings, insufficient payment information, or incomplete history information. For more information, see the D&B Rating Key.

Below is an overview of the company's rating history since 03/13/99:

D&B Rating	Date Applied
--	03/13/99

The Summary Analysis section reflects information in D&B's file as of June 14, 2004.

NEW! Have BEAZER EAST INC's payment habits changed over time?
A Payment Trends Profile will show you - View Now

CUSTOMER SERVICE

If you have questions about this report, please call our Customer Resource Center at 1.800.234.3867 from anywhere within the U.S. If you are outside the U.S. contact your local D&B office.

*** Additional Decision Support Available ***

Additional D&B products, monitoring services and specialized investigations are available to help you evaluate this company or its industry. Call Dun & Bradstreet's Customer Resource Center at 1.800.234.3867 from anywhere within the U.S. or visit our website at www.dnb.com.

HISTORY

The following information was reported **07/21/2003**:

Officer(s): JILL BLUNDON, V PRES-SEC
KAREN MANCE, V PRES-TREAS-CFO
MICHAEL MYER, V PRES

DIRECTOR(S): THE OFFICER(S)

Business started 1944 by the merger of Koppers United Co, Koppers Co, Fuel Investment Associates and Koppers Erecting Corporation. Present control succeeded Dec 1991. Relocated May 1997 from 436 Seventh Ave. 100% of capital stock is owned by the parent company.

JILL BLUNDON born 1953. 1977 graduated University of Pennsylvania Law School with JD. 1977-79 law clerk to US District Judge Knox in the Western District of Pennsylvania. 1979-84 attorney with LTV Corporation. 1984-Nov 85 attorney with Westinghouse Electric Corporation. 1985-present active here. Became vice president and general counsel in Jun 1988.

KAREN MANCE. Antecedents unavailable.

MICHAEL MYER. Antecedents are undetermined.

There are numerous sister subsidiaries, some of the important ones are listed below:

Beazer West, Inc, (formerly known as Gifford-Hill & Company Inc), Dallas, TX; acquired by Beazer PLC in 1986. DUNS #15-744-5081. Active as a general contractor. Intercompany relations consist of sales on normal terms.

Tidewater Construction Corporation, Virginia Beach, VA, started 1921, acquired by Beazer PLC in 1986. Active as a general contractor. Intercompany relations consist of sales on normal terms.

General Crushed Stone Company (Inc), Easton, PA, started 1992. DUNS #05-306-1750. Operates as a stone quarry. Intercompany relations are unknown.

HRI, Inc, State College, PA, started 1992. DUNS #00-340-4126. Heavy construction and stone quarry. Intercompany relations are unknown.

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Kaiser Sand & Gravel Company (Inc), Pleasanton, CA, started 1991. DUNS #08-817-6465. Manufactures ready-mix concrete. Intercompany relations are unknown.

Kentucky Stone Company (Inc), Louisville, KY, started 1992. DUNS #00-694.5414. Heavy construction and stone quarry. Intercompany relations are unknown.

CORPORATE FAMILY

Click below to buy a Business Information Report on that family member.
For an expanded, more current corporate family view, use D&B's Global Family Linkage product.

Buy Selected Report(s)

Global Ultimate:

Hanson Plc	London, England	DUNS # 73-352-5047

Parent:

Hanson Bldg Mtls Amer Holdings	Neptune, NJ	DUNS # 96-734-2197

Branches (US):

Beazer East Inc	Westborough, MA	DUNS # 03-646-1473
Beazer East Inc	Neptune, NJ	DUNS # 11-987-2500
Beazer East Inc	Petrolia, PA	DUNS # 83-540-6729

Affiliates (US):*(Affiliated companies share the same parent company as this business.)*

Boren Brick Hansen	Pleasant Garden, NC	DUNS # 00-322-5091
First Employee Insurance Company	Dallas, TX	DUNS # 03-845-3023
Hanson Aggregates Arizona, Inc	Phoenix, AZ	DUNS # 12-128-9172
Hanson Aggregates Brd Inc	Pavilion, NY	DUNS # 00-213-0375
Hanson Aggregates Central, Inc	Irving, TX	DUNS # 09-356-6040
Hanson Aggregates East Inc	Morrisville, NC	DUNS # 12-824-4097
Hanson Aggregates Pacific Southwest, Inc	San Diego, CA	DUNS # 04-132-2405
Hanson Aggregates Pennsylvania Inc	Easton, PA	DUNS # 00-791-2504
Hanson Aggregates West, Inc	San Ramon, CA	DUNS # 94-773-4554
Hanson Aggregates, Inc	New Kensington, PA	DUNS # 07-496-0618
Hanson Brick Inc	Fort Worth, TX	DUNS # 00-111-9226
Hanson Permanente Cement Inc	Pleasanton, CA	DUNS # 85-847-4224
Hanson Pipe & Products Inc	Dallas, TX	DUNS # 04-766-3716
Hanson Roof Tile Inc	Fontana, CA	DUNS # 02-179-5208
Hanson Spancrete Pacific Inc	Irwindale, CA	DUNS # 00-834-7569
Pioneer International USA Inc	Irving, TX	DUNS # 05-267-2813
The Stone Man Inc	Tucker, GA	DUNS # 04-775-0419
Tiffany Brick Co, L.P.	Fort Worth, TX	DUNS # 05-511-9903
US Brick, Michigan	Corunna, MI	DUNS # 00-111-8657

Affiliates (International):*(Affiliated companies share the same parent company as this business.)*

932220325

HANSON BMA LTD — LONDON, UK (ENGLAND, SCOTLAND, WALES, N.IRELAND) — DUNS # 53-625-4816

Buy Selected Report(s)

BUSINESS REGISTRATION

CORPORATE AND BUSINESS REGISTRATIONS PROVIDED BY MANAGEMENT OR OTHER SOURCE

The Corporate Details provided below may have been submitted by the management of the subject business and may not have been verified with the government agency which records such data.

Registered Name: Beazer East, Inc

Business type:	CORPORATION
Corporation type:	PROFIT
Date incorporated:	SEP 30 1944
State of incorporation:	DELAWARE

Common stock

Authorized shares:	5,000
Par value:	$1.0000

Preferred stock

Authorized shares:	5,000
Par value:	NO PAR VALUE

Where filed: Secretary of State, Dover, DE

OPERATIONS

07/21/2003

Description: Subsidiary of Hanson Building Materials America Inc, Neptune, NJ started 1996 which operates as holding company. Parent company owns 100% of capital stock.

As noted, this company is a subsidiary of Hanson Building Materials America Inc, DUNS number 967342197, and reference is made to that report for background information on the parent company and its management.

Management services engaged in environmental cleanup.

Additional phone number (412)208-8801.

Terms are net 30 days and contracts are progress payments. Has 10,000 account(s). Sells to construction, industrial, commercial and transportation markets. Territory : United States.

The construction materials business is seasonal with more than 70% of sales made between the peak construction period from May 1 to Nov 30.

Employees: Undetermined which includes officer(s). Undetermined employed here.

Facilities: Rents 30,000 sq. ft. in a multi story building.

Location: Central business section on main street.

Branches: Maintains a branch location at Rt 268, Petrolia, PA.

SIC & NAICS

SIC:

Based on information in our file, D&B has assigned this company an extended 8-digit SIC. D&B's use of 8-digit SICs enables us to be more specific to a company's operations than if we use the standard 4-digit code.

NAICS:

562910 Remediation Services

932220326

The 4-digit SIC numbers link to the description on the Occupational Safety & Health Administration (OSHA) Web site. Links open in a new browser window.

49590302 Environmental cleanup services

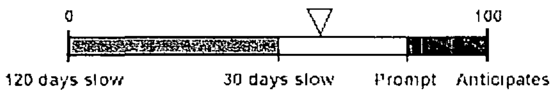
D&B PAYDEX

NEW! Enhanced payment trends and industry benchmarks are available on this business

The D&B PAYDEX is a unique, dollar weighted indicator of payment performance based on up to 25 payment experiences as reported to D&B by trade references.

3-Month D&B PAYDEX: 58

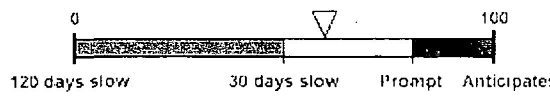
When weighted by dollar amount, payments to suppliers average 24 days beyond terms.



Based on trade collected over last 3 months.

12-Month D&B PAYDEX: 59

When weighted by dollar amount, payments to suppliers average 23 days beyond terms.



Based on trade collected over last 12 months.

When dollar amounts are not considered, then approximately 86% of the company's payments are within terms.

PAYMENT SUMMARY

The Payment Summary section reflects payment information in D&B's file as of the date of this report.

Below is an overview of the company's dollar-weighted payments, segmented by its suppliers' primary industries:

	Total Rcv'd (#)	Total Dollar Amts ($)	Largest High Credit ($)	Within Terms (%)	Days Slow <31 (%)	31-60	61-90	90>
Top industries:								
Public finance	6	7,000	5,000	100	-	-	-	-
Misc general gov't	3	850	750	100	-	-	-	-
Telephone communictns	3	750	250	66	17	17	-	-
Executive office	3	200	100	100	-	-	-	-
Refuse system	2	185,000	100,000	50	50	-	-	-
Physical research	1	95,000	95,000	-	-	100	-	-
Mfg alkalies/chlorine	1	45,000	45,000	50	50	-	-	-
Short-trm busn credit	1	7,500	7,500	100	-	-	-	-
Misc publishing	1	500	500	100	-	-	-	-
Regulate trnsprtation	1	250	250	100	-	-	-	-
OTHER INDUSTRIES	3	200	100	100	-	-	-	-
Other payment categories:								
Cash experiences	0	0	0					
Payment record unknown	0	0	0					
Unfavorable comments	0	0	0					
Placed for collections:								
With D&B	0	0						

932220327

Other	0	N/A	
Total in D&B's file	25	342,250	100,000

The highest **Now Owes** on file is $100,000

The highest **Past Due** on file is $60,000

D&B receives nearly 400 million payment experiences each year. We enter these new and updated experiences into D&B Reports as this information is received.

NEW! **How does BEAZER EAST INC's payment record compare to its industry?**

A Payment Trends Profile will show you - View Now

PAYMENT DETAILS

Detailed payment history

Date Reported (mm/yy)	Paying Record	High Credit ($)	Now Owes ($)	Past Due ($)	Selling Terms	Last Sale Within (months)
05/04	Slow 60	95,000	0	0	N30	1 mo
	(002) Satisfactory.	50				2-3 mos
04/04	Ppt	250	100	0		1 mo
	Ppt-Slow 30	100,000	100,000	60,000		1 mo
	Ppt-Slow 30	85,000	0	0		6-12 mos
	Ppt-Slow 30	45,000	0	0		4-5 mos
	Ppt-Slow 30	250	250	100		1 mo
	(008) Satisfactory.	50				6-12 mos
03/04	(009) Satisfactory.	100				1 mo
	(010) Satisfactory.	50				6-12 mos
02/04	Ppt	7,500	500	0		
	Ppt	500	0	0		6-12 mos
12/03	Ppt	1,000				1 mo
	Ppt	100				1 mo
	Ppt	50				1 mo
	(016) Satisfactory.	50				4-5 mos
11/03	(017) Satisfactory.	50				6-12 mos
10/03	Ppt	100				6-12 mos
	(019) Satisfactory.	750				1 mo
09/03	(020) Satisfactory.	250				1 mo
	(021) Satisfactory.	50				6-12 mos
07/03	Ppt	5,000				1 mo

932220328

	Ppt	750			1 mo
	Ppt	100			1 mo
05/03	Ppt-Slow 60	250	0	0	6-12 mos

Payment experiences reflect how bills are met in relation to the terms granted. In some instances payment beyond terms can be the result of disputes over merchandise, skipped invoices etc.

Each experience shown is from a separate supplier. Updated trade experiences replace those previously reported.

FINANCE

04/04/2003

On April 4, 2003, attempts to contact the management of this business have been unsuccessful. Outside sources confirmed operation and location.

PUBLIC FILINGS

The following Public Filing data is for information purposes only and is not the official record. Certified copies can only be obtained from the official source.

JUDGMENTS

Status:	**Unsatisfied**
DOCKET NO.:	CV94-17145
Judgment type:	Judgment
Against:	BEAZER EAST, INC
In favor of:	MANVILLE CORPORATION
Where filed:	JACKSON COUNTY CIRCUIT COURT, KANSAS CITY, MO
Date status attained:	08/11/1994
Date entered:	08/11/1994
Latest Info Received:	09/20/1994

SUITS

Status:	**Pending**
CASE NO.:	02CV000191
Plaintiff:	F.H.S. MAUSTON, L.P.
Defendant:	BEAZER EAST, INC
Cause:	MONEY JUDGMENT
Where filed:	JUNEAU COUNTY CIRCUIT COURT, MAUSTON, WI
Date status attained:	07/10/2002
Date filed:	07/10/2002
Latest Info Received:	07/18/2002

Status:	**Settled**
DOCKET NO.:	GD 19765-00
Plaintiff:	SPS MANAGEMENT, LLC SPS PROPERTIES, LP
Defendant:	BEAZER EAST, INCORPORATED
Where filed:	ALLEGHENY COUNTY PROTHONOTARY, PITTSBURGH, PA
Date status attained:	12/10/2001

932220329

Date filed: 11/28/2000
Latest Info Received: 11/10/2003

Status: **Pending**
DOCKET NO.: GD 05902-00
Plaintiff: REGIONAL INDUSTRIAL DEVELOPMENT CORPORATION OF SOUTHWESTERN PENNSYLVANIA
Defendant: BEAZER EAST INCORPORATED
Where filed: ALLEGHENY COUNTY PROTHONOTARY, PITTSBURGH, PA

Date status attained: 04/05/2000
Date filed: 04/05/2000
Latest Info Received: 10/17/2003

Status: **Pending**
DOCKET NO.: GD 14290-97
Plaintiff: REGIONAL INDUSTRIAL DEVELOPMENT CORPORATION OF SOUTHWESTERN PENNSYLVANIA
Defendant: BEAZER EAST, INCORPORATED
Where filed: ALLEGHENY COUNTY PROTHONOTARY, PITTSBURGH, PA

Date status attained: 09/10/1997
Date filed: 09/10/1997
Latest Info Received: 06/24/2003

Status: **Pending**
DOCKET NO.: 4809 97 AD
Plaintiff: ALLENTOWN REFRIGERATED TERMINALS, INC.
Defendant: BEAZER EAST, INC., PITTSBURG, PA AND OTHERS
Where filed: BERKS COUNTY PROTHONOTARY, READING, PA

Date status attained: 05/19/1997
Date filed: 05/19/1997
Latest Info Collected: 03/26/1999

Status: **Pending**
CASE NO.: 97540374NZ
Plaintiff: 10000 - DETROIT PRECISION
Defendant: BEAZER EAST INC AND OTHERS
Where filed: OAKLAND COUNTY CIRCUIT COURT, PONTIAC, MI

Date status attained: 03/17/1997
Date filed: 03/17/1997
Latest Info Collected: 03/26/1999

Status: **Change of venue granted**
DOCKET NO.: 94-L-225
Plaintiff: OCTAVIO MACIAS
Defendant: BEAZER EAST INC AND OTHERS
Cause: Negligence
Where filed: ST CLAIR COUNTY CIRCUIT COURT, BELLEVILLE, IL

Date status attained: 09/20/1994
Date filed: 03/07/1994
Latest Info Collected: 03/26/1999

If it is indicated that there are defendants other than the report subject, the lawsuit may be an action to clear title to property and does not necessarily imply a claim for money against the subject.

UCC FILINGS

Collateral: Negotiable instruments including proceeds and products - Inventory including proceeds and products - Account(s) including proceeds and products - Assets including proceeds and products - and OTHERS
Type: Original

932220330

Sec. party:	JPMORGAN CHASE BANK, AS COLLATERAL AGENT, NEW YORK, NY
Debtor:	KOPPERS CONCRETE PRODUCTS, INC., PITTSBURGH, PA
Filing number:	3276535 5
Filed with:	SECRETARY OF STATE/UCC DIVISION, DOVER, DE
Date filed:	10/22/2003
Latest Info Received:	11/18/2003

Collateral:	Negotiable instruments and proceeds - PARTNERSHIP INTEREST and proceeds
Type:	Original
Sec. party:	JPMORGAN CHASE BANK, AS COLLATERAL AGENT, NEW YORK, NY
Debtor:	KOPPERS INC., PITTSBURGH, PA
Filing number:	20031005437
Filed with:	SECRETARY OF STATE/UCC DIVISION, HARRISBURG, PA
Date filed:	10/22/2003
Latest Info Received:	01/23/2004

Collateral:	Negotiable instruments and proceeds - PARTNERSHIP INTERESTS and proceeds
Type:	Original
Sec. party:	PNC BANK, NATIONAL ASSOCIATION, AS ADMINISTRATIVE AGENT, PITTSBURGH, PA
Debtor:	KOPPERS INC., PITTSBURGH, PA
Filing number:	20030475066
Filed with:	SECRETARY OF STATE/UCC DIVISION, HARRISBURG, PA
Date filed:	05/13/2003
Latest Info Received:	10/06/2003

Collateral:	Inventory including proceeds and products - Account(s) including proceeds and products - Assets including proceeds and products - Fixtures including proceeds and products - and OTHERS
Type:	Original
Sec. party:	PNC BANK, NATIONAL ASSOCIATION, AS ADMINISTRATIVE AGENT, PITTSBURGH, PA
Debtor:	KOPPERS INC., PITTSBURGH, PA
Filing number:	20030478147
Filed with:	SECRETARY OF STATE/UCC DIVISION, HARRISBURG, PA
Date filed:	05/13/2003
Latest Info Received:	10/06/2003

Collateral:	Inventory including proceeds and products - Account(s) including proceeds and products - Assets including proceeds and products - Fixtures including proceeds and products - and OTHERS
Type:	Original
Sec. party:	PNC BANK, NATIONAL ASSOCIATION, AS ADMINISTRATIVE AGENT, PITTSBURGH, PA
Debtor:	KOPPERS MAURITIUS, PITTSBURGH, PA
Filing number:	2003057851
Filed with:	DEPARTMENT OF FINANCE & REVENUE/RECORDER OF DEEDS, WASHINGTON, DC
Date filed:	05/13/2003
Latest Info Received:	09/24/2003

Collateral:	Inventory including proceeds and products - Account(s) including proceeds and products - Assets including proceeds and products - Fixtures including proceeds and products - and OTHERS
Type:	Original
Sec. party:	PNC BANK, NATIONAL ASSOCIATION, AS ADMINISTRATIVE AGENT, PITTSBURGH, PA
Debtor:	KOPPERS CONCRETE PRODUCTS, INC., PITTSBURGH, PA
Filing number:	3122397 6
Filed with:	SECRETARY OF STATE/UCC DIVISION, DOVER, DE
Date filed:	05/13/2003

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Latest Info Received:	06/30/2003

Collateral:	Account(s) including proceeds and products - Chattel paper including proceeds and products - General intangibles(s) including proceeds and products - Leased Equipment including proceeds and products
Type:	Original
Sec. party:	PNC LEASING, LLC, PITTSBURGH, PA
Debtor:	KOPPERS, INC., PITTSBURGH, PA
Filing number:	20031273456
Filed with:	SECRETARY OF STATE/UCC DIVISION, HARRISBURG, PA
Date filed:	12/19/2003
Latest Info Received:	03/29/2004

Collateral:	Account(s) including proceeds and products - Chattel paper including proceeds and products - General intangibles(s) including proceeds and products - Leased Computer equipment including proceeds and products - Leased Equipment including proceeds and products
Type:	Original
Sec. party:	PNC LEASING, LLC, PITTSBURGH, PA
Debtor:	KOPPERS, INC., PITTSBURGH, PA
Filing number:	20031198636
Filed with:	SECRETARY OF STATE/UCC DIVISION, HARRISBURG, PA
Date filed:	12/01/2003
Latest Info Received:	03/29/2004

Collateral:	Account(s) including proceeds and products - Chattel paper including proceeds and products - General intangibles(s) including proceeds and products - Leased Computer equipment including proceeds and products - Leased Equipment including proceeds and products
Type:	Original
Sec. party:	PNC LEASING, LLC, PITTSBURGH, PA
Debtor:	KOPPERS, INC., PITTSBURGH, PA
Filing number:	20031069957
Filed with:	SECRETARY OF STATE/UCC DIVISION, HARRISBURG, PA
Date filed:	10/31/2003
Latest Info Received:	01/27/2004

Collateral:	Account(s) including proceeds and products - Chattel paper including proceeds and products - General intangibles(s) including proceeds and products - Leased Computer equipment including proceeds and products - Leased Equipment including proceeds and products
Type:	Original
Sec. party:	PNC LEASING, LLC, PITTSBURGH, PA
Debtor:	KOPPERS, INC., PITTSBURGH, PA
Filing number:	20030913915
Filed with:	SECRETARY OF STATE/UCC DIVISION, HARRISBURG, PA
Date filed:	10/01/2003
Latest Info Received:	01/27/2004

There are additional UCC's in D&B's file on this company available by contacting 1-800-234-3867.

The public record items contained in this report may have been paid, terminated, vacated or released prior to the date this report was printed.

GOVERNMENT ACTIVITY

Activity summary

Borrower (Dir/Guar):	NO

932220332

Administrative debt:	YES
Contractor:	NO
Grantee:	NO
Party excluded from federal program(s):	NO

Possible candidate for socio-economic program consideration

Labor surplus area:	N/A
Small Business:	N/A
8(A) firm:	N/A

The details provided in the Government Activity section are as reported to Dun & Bradstreet by the federal government and other sources.